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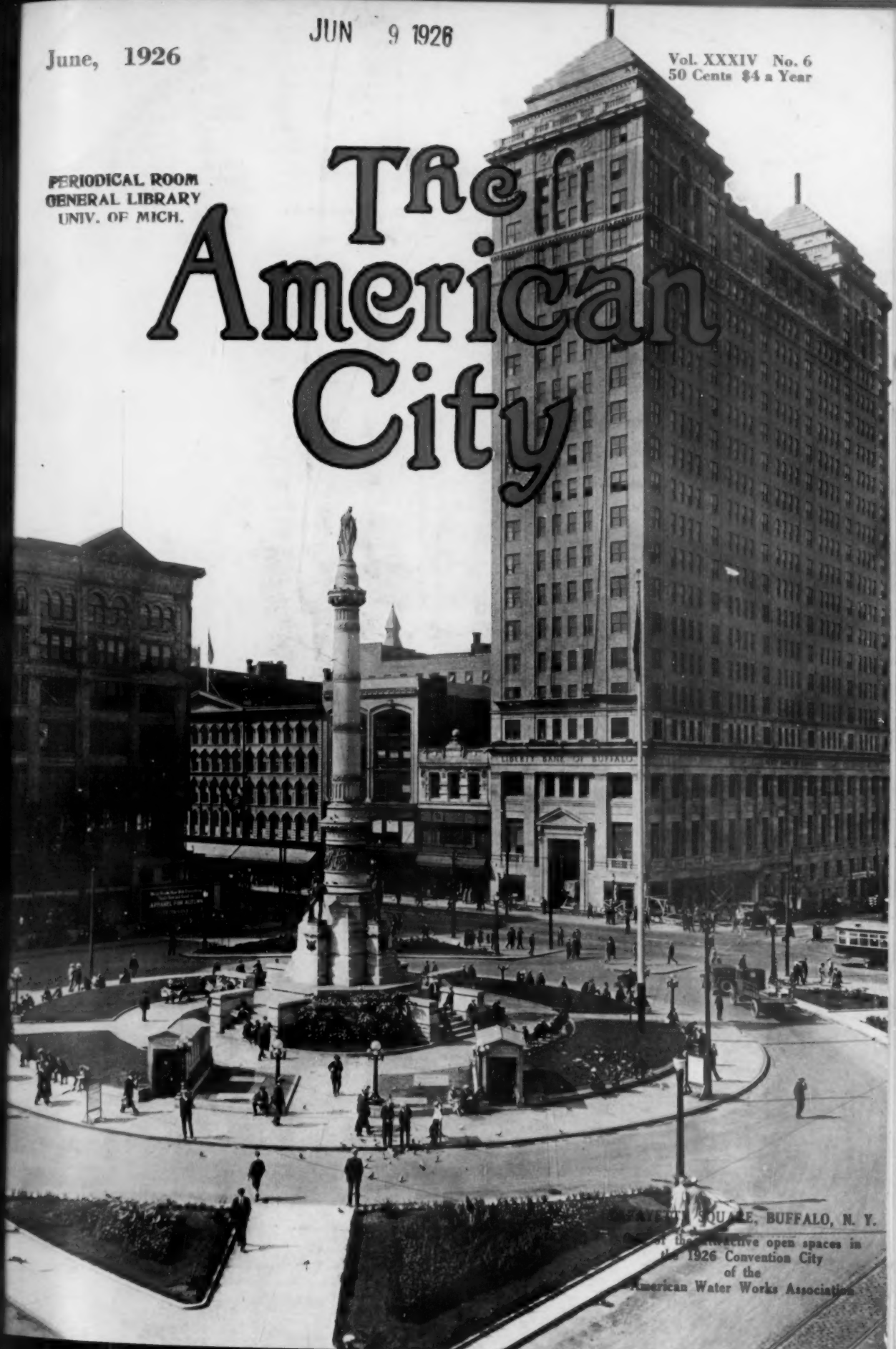

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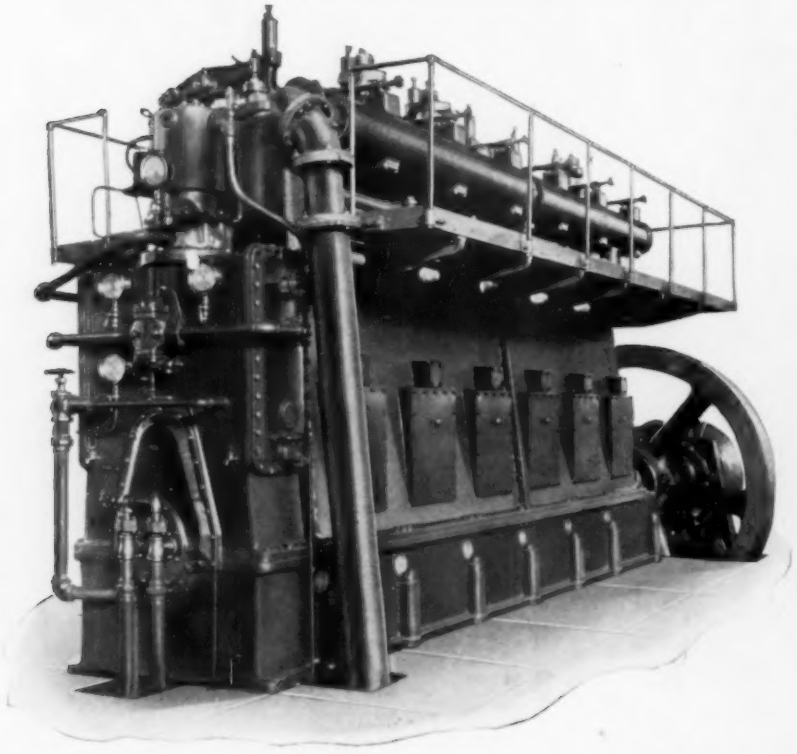

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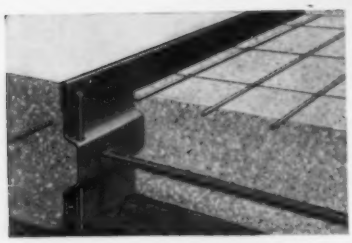

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The New Water-Supply System at Tampa, Florida

Consumers Appreciate Change from Hard to Soft Water Made Possible by Careful Planning and New Plant with Unique Features

RECENTLY Tampa has completed a stupendous project in providing a new water-supply. This has been received with considerable acclaim by the consumers, who have been used to hard water, but are enjoying the advantages of a really soft water. Nicholas S. Hill, Jr., consulting engineer, New York, was the engineer for the city, and the following material is prepared from his paper on the project recently read before the New England Water Works Association. The paper begins with a historical summary of the development of Tampa, showing that this city is one of substantial industries and resources and that its growth is not wholly the result of the recent Florida real estate boom.

The Tampa Water Works Company was organized in 1887 by private interests and was purchased in 1923 by the city of Tampa, acting upon the advice of a committee of which Mr. Hill was a member. Considerable difficulty from salt and other mineral substances was experienced under the old well system. One new well after another was drilled to keep up with the demand, until in 1923 there had been 45 wells drilled while but 24 were in use, and of the 24 but few had consistently delivered a suitable water.

Rapid Increase in Consumption

In 1923, when the company passed into the hands of the city, the average daily pumpage from the wells was 7½ million gallons per day. The subsequent increase to 12 million gallons a day in 1925 forced the city to employ every expedient to avert a famine until such time as a new and adequate supply could be developed and placed in operation. Even before the purchase of the water plant by the city, the officials were alive to the necessity of obtaining a better supply, and in 1922 Mr. Hill was retained to investigate and report upon

TAMPA WATER-WORKS, ON HILLSBORO RIVER

The settling basins are seen in the foreground, the power-house and pumping-station at the left, and the purification, decolorizing, softening, and filtration plant at the right

THE INTAKE CHAMBER OF THE NEW TAMPA WATER-WORKS, TAKEN WHEN WATER WAS LOW

What appears to be a gravel bar in the foreground is a growth of floating water-plants, which are common in the rivers of Florida during part of the year

all available new sources. Exhaustive examinations extending over a period of eighteen months were made, involving a survey of ground-water conditions, daily-flow measurements of springs and surface supplies, surveys to determine the elevation of sources and profiles for transmission lines, as well as the regular chemical and bacteriological analyses of all waters. As a result of the investigations, the Hillsborough River was finally selected for development. The recommendation was based on the largest supply available and the low first cost and the operation cost as compared with the other sources considered.

The New Supply

The site chosen for the pumping-station and treatment plant is six miles from the center of the city and one-half mile upstream from a dam and power-plant owned by the Tampa Electric Company. The drainage area above the point of intake is 535 square miles, much of which consists of swamps and entirely undeveloped land. The river is fed by a number of springs, the largest of which, Crystal Spring, flows from 35 to 40 million gallons per day. The dry-weather flow at the intake was originally estimated at 50 million gallons per day, and during the rainy season a flow of 600 to 700 million gallons per day is usual. By securing the right to draw upon the lake formed by the Tampa Electric Company's dam, the safe yield of the river at the new waterworks intake may be increased considerably.

The sanitary quality of the untreated water is good. Although softer than all the other supplies considered, this one also requires softening at some seasons of the year. During the rainy season the swamps overflow and a highly colored soft water results, while during the dry season, when the flow is mainly derived from springs, the color is low and the hardness high. The variation in the quality of the water at different seasons is shown in the following table:

	Parts per Million	
	Rainy Season	Dry Season
Color	200	25
Total hardness	25	200
Alkalinity	24	140
Sulphate hardness	1	60
Turbidity	1	0

In order to determine the best methods of handling the widely varying waters of the Hillsborough River, an experimental plant, having a capacity of 25,000 gallons per day, was erected in August, 1924, and was operated until February, 1925, by which time a complete cycle of the water had been studied.

The New Works

From a study of the relation between quality and rates of pumpage, it was determined that a supply of approximately 6,000,000 gallons per day could be drawn from the existing wells without securing an excessively hard or saline water. The new plant was therefore designed of a nominal capacity of 12 to 15 million gallons per day, giving a total combined plant capacity of 18 to 21 million gallons per day of soft water low in color and low in salinity. With the overload capacity and storage, the plant will meet peak loads of 25 to 27½ million gallons daily.

The new works, the construction of which was begun in August, 1924, are just being completed. They comprise an intake, a combined low- and high-lift pumping-station, a treatment plant for softening, decolorizing, recarbonating, and filtering the water, a 30-inch cast iron force main some 3 miles in length, and three 500,000-gallon elevated storage tanks. A spur track from a railway one-half mile distant was built to facilitate construction and delivery of chemicals.

Treatment Processes

Decolorizing.—Aluminum sulphate and sulphurous acid are used for color removal. Heretofore, aluminum sulphate has been used alone, but by the addition of sulphurous acid the alkalinity may be neutralized and the hydrogen-

ion concentration raised to a point where the most complete precipitation of the aluminum sulphate as aluminum hydroxide takes place, thereby lessening the amount of aluminum sulphate required and lowering the cost of operation. Lime or soda ash, added after filtration, again lowers the hydrogen-ion concentration and cuts down the amount of free carbon dioxide in the water to a point where the water can be distributed safely without corrosion of the distribution system.

Softening.—During a portion of the year softening is required in addition to the decolorizing treatment. The flexibility provided in the design of the sedimentation basins makes it possible to change rapidly from a decolorizing to a decolorizing and softening plant. By the use of hydrated lime the carbonate hardness is thrown down. If, in addition, the water has a sulphate hardness, soda ash is added to reduce it. The water then passes to decolorizing tanks and basins where aluminum sulphate is added. The aluminum sulphate lowers the causticity due to the addition of lime and removes the color. The water then passes to a carbonating chamber.

Recarbonization.—It is believed that in recarbonization has been found the solution of one of the most perplexing problems in modern water purification. The evils of the usual softening plant have been avoided in the Tampa plant by the introduction of recarbonization, which eliminates the precipitation of calcium carbonate in filter drains, distribution system, and meters, and the so-called sand growth in the filters, and in addition gives a more palatable water. The amount of carbon dioxide introduced can be regulated accurately by the chemist in charge.

Pumping-Plant

The pumping plant of 25 million gallons installed capacity consists of an intake and a steam pumping-station containing a boiler-room and a two-level pump-room. The construction is hollow tile stuccoed with a red tile roof.

Intake.—A concrete intake chamber 31 feet in height was placed in the center of the river channel in approximately 25 feet of water. It has three openings controlled by 48-inch sluice-gates protected by iron bar screens. From the intake chamber the water flows through a 36-inch iron intake pipe about 225 feet long, to a screen and suction wells adjacent to the pumping-station. Here, removable copper screens prevent trash entering the pump suction.

Pumping-Station.—The boiler room contains three Babcock and Wilcox water tube boilers rated at 200 horsepower each, and space is provided for a fourth boiler. W. N. Best steam atomization burners and equipment are used. Fuel oil is burned, although the boilers are adaptable to coal. Steam is furnished at 175 pounds pressure and 100 degrees superheat.

The low-lift pumps, located on a lower floor of the pumping-station, are two 12½- and one 6½-million-gallon-per-day De Laval centrifugal pumps driven by De Laval steam turbines. They operate against a head of 30 feet, picking up the water from the screen or low-lift suction well and pumping it to the treatment plant. Two 50-kw. direct-connected, non-condensing, steam-driven generators located on this floor furnish current for lighting the plant and for various motor-driven equipment.

The high-lift pumps are placed on a mezzanine floor at the ground level and 10 feet above the level of the low-lift pump-room. The present installation consists of two 10- and one 5-million-gallon-per-day De Laval two-stage centrifugal pumps, driven by De Laval steam turbines. The pumps operate against a head of 200 feet.

On this floor are located the gage-boards, Venturi meter register and wash-water stage indicator, together with an alarm bell and light and a filtered-water reservoir stage indicator, etc. All operations throughout the plant are fully metered. The space on the lower level underneath the mezzanine is de-

CHEMICAL FEEDING APPARATUS AT NEW TAMPA WATER-WORKS

voted to the condensers and wash-water pumps. Three Wheeler surface condensers equippped with steam jet air pumps capable of maintaining a 28-inch vacuum are used. Duplicate 350-gallon-per-minute water-motor-driven wash-water pumps have been installed.

The pumping-station is so arranged that from the high-lift floor the engineer can watch the operation of the entire pumping-station. The low-lift pumps and generators on the lower level are in full view of the operator, and operations in the condenser room may be seen through openings in the mezzanine floor.

Treatment Plant

The treatment plant of 12 to 15 million gallons daily initial rated capacity has been designed so that by the addition of new units the capacity may readily be enlarged to 36 million gallons daily without impairing the symmetry. The plant comprises mixing tanks and sedimentation basins, chemical house, filter house, gravity mechanical filters, and a filtered-water reservoir.

Mixing Tanks.—Eight lime mixing tanks, 24 feet square, and eight aluminum sulphate mixing tanks each 18 feet 8 inches square have been constructed. Each tank is provided with a bronze impeller set in a 14-inch draft tube and operated by a 1-horsepower motor which is controlled by an individual switch and protected by a copper hood, as no covering is provided for the mixing tanks and sedimentation basins. Two mixing tanks separated by a top baffle are always used in series. The chemical solutions enter the mixing tanks through an orifice box provided with a brass orifice plate, so as to give equal dosage to all tanks in use.

Sedimentation Basins.—Two lime settling basins, each of one-million-gallon capacity, or sufficient to give a four-hour detention period when operating at the normal rate, and two decolorizing basins, each of ¾-million gallon capacity, giving a detention period of three hours, are provided. These basins can be operated either in series or in parallel.

A novel sludge drainage system has been installed. Through the first half of each settling basin a series of lateral drains consisting of 6-inch vitrified bell-and-spigot pipe tees have been laid on the floor of the basin with the branch of the tee pointed up and set flush with the finished floor. A 6-inch vitrified plug with a 1-inch orifice is placed in each bell. Sloping concrete ridges separate the rows of pipe. The underdrains are connected up to the headers at the side of the basin which collect and discharge from sections consisting of five lines of underdrains. Each header is controlled by a gate-valve and discharges into a 12-inch cast iron pipe leading to the sewer. By opening the gate-valve the water in the basin is utilized to flush out the sludge which has been deposited over the bottom of the basin. An interesting feature of the sludge drainage system is that it may be backwashed with water under moderate pressure so that if the sludge surrounding the drains becomes hard aad caked it may be loosened.

Conduits.—Because of the wide variation in the character of the water to be treated a great deal of attention is given to the attainment of flexibility in operation. This is secured by means of an additional conduit serving the various mixing tanks and settling basins, together with additional inlet and outlet openings controlled by stop planks. One wall along the mixing tanks and settling basins has been made double and contains a bank of four conduits. The upper or raw water conduit conveys the raw water to any group of mixing tanks desired. The second, or settled water conduit, conveys the settled water to the filters. The third, or transfer conduit is so arranged that water may be taken from any one settling basin and discharged into any other basin. The lowest conduit leads to the sewer and is used to discharge the accumulated sludge.

In the the top of the upper conduit 12-inch and 15-inch half-round tile pipe encased in concrete have been placed. These conduits convey the chemical solutions to any desired mixing tank. Access to the trough is provided at frequent intervals by checker plate covers.

Chemical House.—The chemical house is a two-story reinforced concrete structure with stuccoed hollow tile curtain walls and a red tile roof. On the lower floor are located the unloading room, retort room, and chemical feed room. The second floor is devoted to chemical storage and handling. Freight cars bearing aluminum sulphate, soda, and lime are brought directly into the building and the most modern facilities for handling and storage have been installed. The chemical feed room on the first floor contains six motor-driven Gaunt dry feed machines located directly under six concrete hoppers suspended from the second floor. The machines are of the manually controlled type and are in duplicate. They are set over troughs through which water is pumped which dissolves the chemicals and conveys them to the point of application.

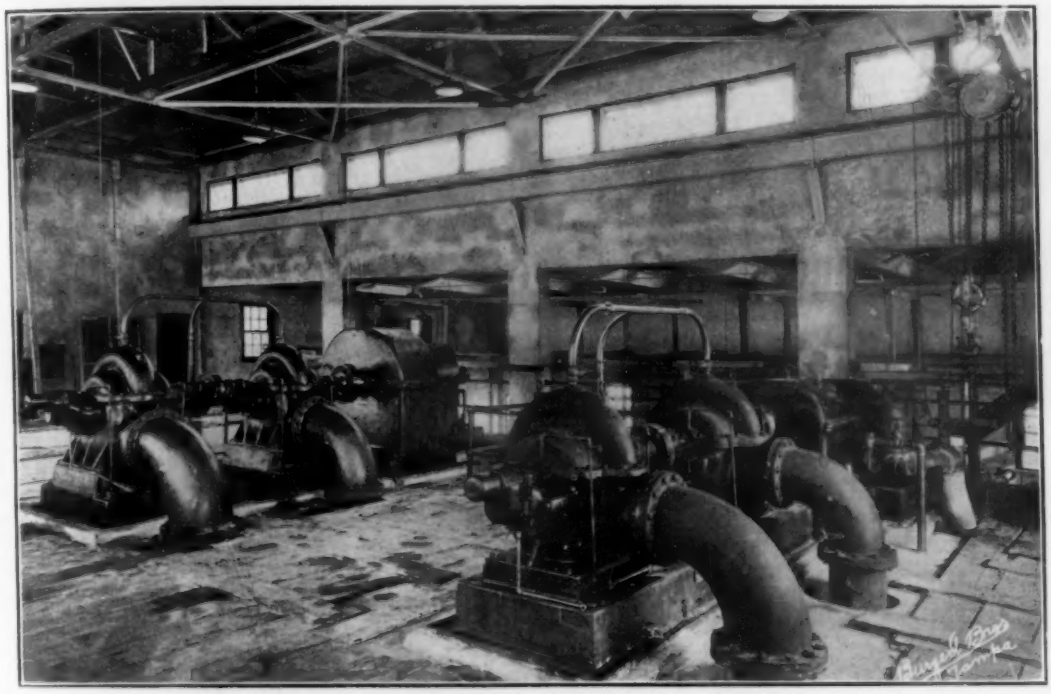
The retort room is adjacent to the unloading

platform. Sulphur dioxide and carbon dioxide are made here. Sulphur is burned in two Schutte and Koerting burners forming sulphur dioxide gas. The gas is cooled in a water-jacketed manifold, from which it passes to a cypress absorption tank outside the building. In the upper compartment of this tank the gas is baffled. Water is then sprayed through it, and in the dissolved form, sulphurous acid, it is stored to be introduced as needed into the same chemical trough with the aluminum sulphate.

The carbon dioxide equipment was furnished by the Carbondale-New York Company and consists of a coke furnace with a maximum capacity of 1,200 pounds per day, a scrubber, and a small compressor. The gas is applied in a carbonating chamber located under the chemical feed room.

Filter House.—The filter house is a one-story hollow tile and stucco building. A great deal of attention has been given to the architectural details of this building and, in fact of the entire plant, which is located in a 55-acre city park. The filtration room is the reception room of the plant, and the best type of Moorish-Spanish architecture is followed out in line and detail in both interior and exterior. Ornamental columns conceal steel supports, wiring, and pipes. Low parapet walls enclose the filters. A tiled fountain is installed in the entrance lobby. The appearance is entirely dissimilar to that of the usual filter galley, impressing one as a cool, spacious stone corridor.

Laboratory and Offices.—A corridor leading from the filter gallery to the chemical house makes the two into one large building. Along the corridor are located the laboratory, office chlorine room, and lavatories. The laboratory is completely and adequately equipped. The chlorine room contains two Wallace & Tiernan vacuum type M. S. V. chlorinators feeding directly into the filtered water conduit which passes underneath the room.



THE HIGH-LIFT PUMPS OF THE TAMPA WATER-WORKS JUST BEFORE THE STATION WAS COMPLETED AND PLACED IN SERVICE

Filters.—Eight concrete gravity filters having a normal capacity of 1½ to 1¾ million gallons each are included in the present installation. The filters are built in two sections, having a combined area of 600 square feet. The sections are separated by a deep central trough which serves the double purpose of inlet for the settled water and outlet for the wash water. Perhaps the most interesting feature of the filters is the strainer system. Half-round, 6-inch diameter cast iron pipes are used. These are raised above the floor by lugs cast on the bottom of the pipe, thus forming practically a continuous horizontal orifice ½-inch wide on both sides of the pipe. Small holes in the top of each of the pipes provide

for the release of entrained air. Seven layers of gravel, varying from 2½ inches to 1/16-inch in size and totaling 18¾ inches in depth, cover the lateral pipes. Thirty inches of sand, having an effective size of approximately 0.4 millimeters and a uniformity coefficient of 1.6, are spread upon the gravel.

Beneath the operating gallery is located the pipe gallery, which is interesting in having unobstructed passageways and freedom from a large amount of complicated piping.

The wash water, which is stored in a 100,000-gallon elevated tank, is controlled by means of a Ross pressure-reducing valve. Concrete sewers installed underneath the pipe gallery carry the waste to a 30-inch sewer which discharges into the river below the dam almost a mile from the plant.

Filtered Water Reservoir.—The filtered water reservoir is a covered basin of one-half million gallons capacity. It is 94 feet square and divided into two compartments by an end baffle wall. From the filtered-water basin the water flows to a suction well adjacent to the pumping-station, where it is picked up by the high-lift pumps and pumped directly into the distribution system, the main feature of which is a 30-inch cast iron force main about three miles long, two 24-inch lines connecting with the old distribution system, and three elevated tanks each of 500,000 gallons capacity erected in different sections of the city.

Conclusion

The construction of the plant was carried on under fifteen separate contracts. The concrete and building work was performed by the Gauger-Korsmo Construction Company, Memphis, Tenn. The filter and chemical apparatus was furnished by the American Water Softener Company, Philadelphia, Pa. Pumps, boilers, and pumping-station piping were furnished and installed by Burford, Hall and Smith, Atlanta, Ga. Cast iron force and distribution piping and the main waste sewer from the plant were laid by Benjamin Thompson, Tampa, Fla. The elevated tanks were furnished and erected by the Chicago Bridge and Iron Works, Chicago, Ill. The pumping-station chimney was built by the Alphons Custodis Chimney Construction Company, New York City. The cast iron pipe and specials were furnished by the United States Cast Iron Pipe & Foundry Company, Burlington, N. J. All valves were furnished by the Iowa Valve Company, Oskaloosa, Iowa. The spur track was laid by the Seaboard Air Line Railway Company. The foundation for one of the elevated tanks was constructed by George Binger, Tampa, Fla.

The preparation of plans and specifications for the plant were in charge of Horace H. Chase, Stuart K. Knox, and A. T. Ricketts, associated with Nicholas S. Hill, Jr. George H. Buck was Resident Engineer and was assisted in the field by E. L. Hyde and A. J. Barclay. Mr. Chase has also had general supervision of construction. The preliminary chemical and biological work was in charge of Mr. Hill's laboratory.

The particular points in which this plant differs materially from the usual water-works development are: first, that special attention was paid to architectural details providing exceptional ventilation and lighting and combining utility with beauty; second, the manufacture and use of sulphurous acid and carbon dioxide gas; third, a new type of filter strainer system; fourth, a simple sludge disposal system; fifth, centralization and convenient control, both in the pumping-station and the filtration plant; sixth, an unobstructed pipe gallery; and seventh, comprehensive provision for future extensions.

Amsterdam, N. Y., Chlorinated Water-Supply During Reservoir Repairs

DURING the fall of 1925 it became necessary to draw down the level of the water in the distributing reservoir which supplies the city of Amsterdam, N. Y., in order to make repairs. In addition to this work a large earth embankment had to be replaced, so that the reservoir was out of service about three months, during which time a large number of men and teams were employed in the basin. Upon placing the reservoir in service again, according to *Health News*, New York State Department of Health, it was considered essential that the water be chlorinated before being delivered to the consumers because of the possible pollution of the water incidental to the construction work. The emergency chlorination apparatus of the State Department of Health was installed on December 26, 1925. Inasmuch as ice is cut from the reservoir during the winter, the water-supply officials were advised to continue chlorination of the water during the ice-cutting season.

The city has decided to purchase chlorinators in order that the supply may be treated continuously, in accordance with recommendations of the State Department of Health.

Operate Electric-driven Pumps in Off-Peak Hours of Power-Plant

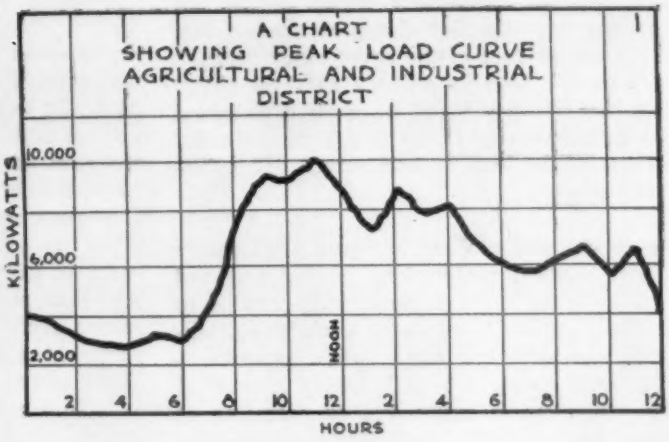
By J. A. Rue

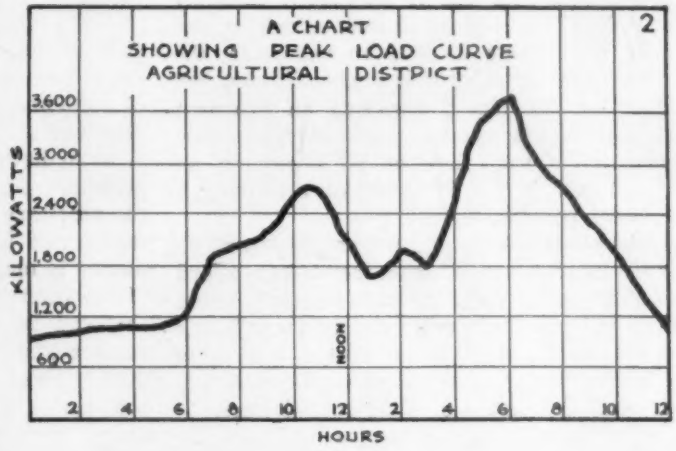
Water Engineer for the Central Illinois Public Service Company

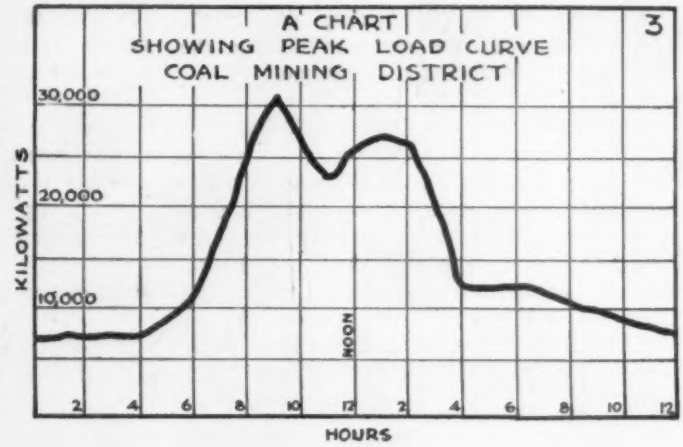
A PEAK-LOAD period in the electrical industry is known as that portion of the day when the load demand for service by the customers is at the maximum. In this discussion we will vary the definition to cover that portion of the day when the demand is materially greater than the average for the 24 hours. This usually occurs from 8:00 o'clock in the morning until noon and from 1:00 until 4:00 o'clock in the afternoon, and again from 7:00 to 8:00 o'clock in the evening. This general curve will vary between wide limits, and is influenced by the season of the year, loads, climate, and many other factors.

The ideal load for any power system would be a constant, uniform demand of the capacity for which the system was designed. This condition seldom, if ever, exists, and load curves show the demand to be quite variable. To illustrate the variation of demand placed upon the modern plant, the accompanying charts are reproduced.

The first represents the actual demand of an operating division of an electric power company which serves a large agricultural region. This division also serves a large number of small factories, pumping-plants, and other miscellaneous industrial loads. The peak load occurs at 11:00 o'clock in the morning. The lighting loading, which comes on from 7:00 to 9:00 P. M., does not approach the peak caused by the industrial load.







There is also a drop in load from 12:00 to 2:00 o'clock. The noonday drop is characteristic of all districts. The second chart shows the demand for another agricultural district that has a lower industrial load than shown on the first chart, and for this reason the peak demand is produced by the lighting load. The third chart shows the demand for a division serving a large number of coal mines. The load is exceedingly heavy during the working day and then drops off 60 per cent for the remainder of the twenty-four hours.

It can be seen by a study of these charts that the heavy demand or peak load period for each locality, division, or system is characteristic of the kind of load served and varies considerably.

Power Companies Want to Better Load Factor

The modern power-plant is designed and equipped with sufficient generating capacity to amply serve its territory at peak-load conditions, therefore the total station capacity is used only during the peak loads. A part of the equipment is either idle or operating at less than full load the remainder of the day. It has been said that if an electric company can double its power factor, which is the ratio of average demand to maximum, the value of its investment is practically doubled. Since the load factor bears such an important relation to its net earnings, every electric company is very desirous of improving its load factor by obtaining all of the off-peak business possible.

The electric light and power companies, in order to improve the load factor, can afford to offer special rates for any class of business that will use the service during the off-peak hours. Such industries as bakeries, coal mine drainage districts, and some kinds of factories, do avail themselves of these special rates.

The electric traction companies have partially solved their peak-load problem by developing sufficient freight hauling during the off-peak hours of the night to balance the passenger traffic during the daytime.

Off-Peak Pumping Costs Much Less

A city contemplating the design of a new pumping-station or the revamping of an existing station should learn from the power company serving that community what rate could be secured by pumping during off-peak hours. This rate might justify a comparatively large investment for elevated storage capacity or other special features of design. The use of electrical energy for pumping water whether on peak load or off-peak load is not only convenient but economical, for the investment per horsepower is low, the maintenance is small, and the simplicity of operation is a distinct advantage. These advantages have been recognized by many water companies and municipalities throughout the state which have electrified their pumping-stations during the last five years.

While it is not possible for all water stations to operate their pumping equipment during off-peak hours, there are a large number that could satisfactorily operate in this manner. The water stations that could not wholly use off-peak service could in a great many instances do part of the pumping during the off-peak hours.

A great many small towns of 2,000 population or less have an elevated storage of sufficient capacity to last through the electric peak-load period. Such towns could probably reduce their power bills by operating their plants at night instead of in the daytime. There are also towns so blessed by nature as to have a natural elevated storage and these can do all of their pumping on the off-peak period.

There are many cities which have large surface storage sufficient to last two or three days. The reservoirs are either of concrete or of earth and are replenished by pumpings from deep wells, rivers, or other sources of supply. A town having this arrangement can fill the reservoir during the off-peak hours and do the necessary service pumping during the peak hours, and in this way effect a considerable saving in operation.

The determination of the amount of money that can be spent on elevated tanks and on surface storage of sufficient capacity to permit operation with cheap off-peak power is a problem of economics. The water-plant engineer can readily calculate the savings to be secured by lower rates from pumping during the off-peak hours as compared with the interest on the investment necessary to install elevated tanks or to build surface storage. It would be surprising to learn how large an amount can be spent in this connection with no increase in the total operating cost. State fire inspection bureaus will give a better insurance rating to towns having a large elevated storage than to towns with small storage.

Dual Meters Take Care of Peak and Off-Peak Loads

Rapid strides have been made in the perfection of electric metering equipment and it is

now possible to install a dual meter set with time-switch so that it will meter the power used during the peak period on one meter and the power used on the off-peak period on the other meter. By this method, different rates can be charged for the power used over the two different load periods.

With this arrangement the operating of the water plant could be such that the greatest saving could be effected by operating as many hours as is possible during the off-peak period.

Operation with this dual metering equipment has already been used by various classes of power users. In my opinion, there is no reason why the water plants cannot take full advantage of such operation.

It is recommended that every manager of a water plant investigate the possibility of operating a part or all of his pumps on off-peak load periods.

ACKNOWLEDGMENT.—From a paper read before the Illinois Section, American Water Works Association.

The Water-Works of Bellefonte, Pa.

By James D. Seibert
Borough Manager

THE water-supply of Bellefonte is secured from Big Spring, which has a temperature of 50 degrees throughout the year. This spring furnishes about 2½ million gallons per day for a population of about 5,000 people. The pressure in the mains varies from 10 pounds to 95 pounds. When the weather is not too cold in the fall or spring and there is a light fall of snow, it is possible to trace the water-mains over the town, where they are not laid very deep, as the snow melts directly over the mains. This also makes it easy to trace leaks, for if a spot is seen where the snow is melted from 3 to 8 feet in diameter, it is good evidence of a leak.

The pumping-station is built of native blue limestone, and it cost, with the new pump and motor equipment, the stone fence and drinking fountain and spray fountain, about $18,000. In the front room at the left is the office of the Borough Manager, which is also used by the Burgess for his hearings. The pumping equipment consists of one Alberger two-stage centrifugal pump of 950 gallons per minute capacity, driven by a 75-horsepower General Electric motor, one Dean-Hill two-stage centrifugal pump of 1,000 gallons per minute capacity, driven by a 75-horsepower Westinghouse motor, and one Aldrich triplex pump driven by a 35-inch Huston turbine water-wheel from the overflow of the spring, which amounts to about 6,000 gallons per minute

BIG SPRING AND PUMP-STATION, BELLEFONTE, PA.

after the pumps are supplied. The capacity of the spring is about 8,000 gallons per minute and remains the same, no matter how dry the season. The spring is 77 feet by 62 feet 8 inches in area, and is 8 feet deep.

Water is pumped directly into the mains, and when consumption is less than the amount of water pumped, the remainder goes to the reservoir on the hill, which is 196 feet above the spring, giving a static pressure of 85 pounds.

The capacity of the reservoir is 300,000 gallons. The water-level drops about 4 feet every day, and the reservoir is filled at night. As soon as the water reaches the control float in the reservoir in the early morning hours, it turns the switch and stops the one pump.

Water-rates in Bellefonte are 5 cents per 1,000 gallons for the first million gallons, and 3 cents per 1,000 gallons thereafter for mechanical purposes. Domestic rates are on a flat basis and depend on the size of the house and equipment. An eight-room house with complete bathroom and kitchen sink costs $11 per year.

Old Turbine Water-Wheel

The turbine water-wheel being used in Bellefonte was built in 1870 and differs considerably from the wheels built today, although we feel that it has some features that are better than some of the more modern units. The wheel uses a low head and operates on a larger diameter. A modern 35-inch wheel operating on a 7-foot head would require about 32,000 gallons per minute, while the consumption of this wheel is only about 6,000 gallons per minute. Some time ago the wheel was thrown out by the Water Committee, who contracted with a large water wheel manufacturer for a 24-inch wheel. This new wheel operated for a few minutes, pumping 50 gallons per minute, and then petered out for want of power, until it stalled and the water raced through the casing without moving the wheel.

The new wheel was removed and the old wheel again installed, and a number of the vanes closed up so that the combined area of the vane openings was equal to the number of square inches required to permit the flow of 6,000 gallons a minute. The chutes were made longer and at an angle which increased the velocity of the water, similar to a long nozzle on a fire-hose. The water-wheel is now pumping 130 gallons per minute, using only 6,000 gallons a minute for power.

The water committee of Bellefonte, Pa., consists of J. M. Cunningham, Benjamin Bradley, and W. H. Brouse, and H. P. Harris is Burgess.

How Milwaukee Sanded Its Streets Last Winter

With Grades of 8 Per Cent to 16 Per Cent, Auto Traffic Operated with Ease

By Charles O. Davis
Superintendent of Street Sanitation, Milwaukee, Wis.

IN the Northwest, constant care and thought are required to have the highways of the cities in condition for the demands of present-day traffic. To obtain the proper results, neither the 8-hour day, the 5½-day week, nor Sundays and holidays can be observed. With all the modern equipment for snow removal, such as motor-truck plows and power loaders, there is something else required to make automobile traffic possible with safety and comfort. The writer, having been connected for a number of years with the street railway company as road master, where he found it necessary to use sand on all hills to make possible the ascent, as well as safe descent for street cars, carried out this same idea with respect to automobile traffic by spreading sand on snow and ice covered streets of uneven grades.

With this idea in view, last summer eighty 2-yard sand boxes were built and in the early fall placed near bad grades, sharp curves, and other dangerous intersections. Each box was then filled with dry sand and a shovel placed in it. When the conditions required it, night or day, and the regular street gang was not on duty, the officers of the traffic squad used the shovel to good advantage. This arrangement has worked out well, and it is needless to say that the boxes were refilled many times during the winter.

The results obtained were highly complimented by the traveling public and requests were made to have sand spread on all streets. Where conditions actually warranted it, this was done. In such cases, however, as well as on arterial highways and on the viaduct, the sand was applied with a two-horse spreader

which sprays it over a width of 10 feet as readily as the team can walk. A ¼-yard hand spreader is also used to take care of intersections and crosswalks.

In the outlying districts especially, we have also used fine, clean cinders as well as granulated iron ore slag, these materials being cheaper than sharp, clean, dry sand.

Numerous personal injuries, not to mention accidents in which automobiles were more or less seriously damaged, were avoided by the adoption of this system of precaution. It would be well for other cities to consider this method of protecting both vehicular and pedestrian traffic from the possibility of accidents on icy streets next winter.

New Water-Supply for Athens and Piraeus, Greece

By Adolph G. Wulff

WITHIN a few years the ancient cities of Athens and Piraeus in Greece, which have been supplied with water through aqueducts that were built by the ancients and that are now inadequate, will have a new works built by Americans. The new work consists in constructing a large reservoir in the vicinity of the ancient plain of Marathon, with new conduits to the cities of Athens and Piraeus, a complete distributing system, and a salt-water supply for sprinkling the streets and for fire protection.

The reservoir to be constructed near Marathon will have a capacity of 35,000,000 cubic meters. The dam will be of concrete, 280 meters long and 55 meters high. The rough concrete of this gravity dam is estimated at 140,000 cubic meters, and the face concrete is estimated at 6,000 cubic meters.

Two routes for the new aqueduct from the Marathon dam are under consideration. One is around the Pentelikon Mountain, which will have a total length of 37.6 kilometers, with 28.50 kilometers in tunnel, 8.40 kilometers in open cut, and 0.7 kilometers as an inverted siphon. The other will have a total length of 26 kilometers, with 13.5 kilometers in continuous tunnel, 3.8 kilometers in open cut, and 8.6 kilometers in siphons.

Salt-Water System

For fire protection and for sprinkling the streets, a salt-water system will be installed. Two Goulds centrifugal pumps with a total capacity of 400 gallons per minute against a head of 145 meters will be installed at the Bay of Phaleron. These will be operated by alternating-current electric motors, the current for which will be generated by two 300-horsepower De La Vergne diesel engines. The water will be carried from the sea through a 12-inch cast iron main to Athens. This system will have a minimum capacity of 8,000 cubic meters per day.

Temporary Relief

The supply of water through the ancient aqueduct built by Hadrian was very meager, and as a temporary relief new galleries from the limestone rocks are being constructed and a connection 3.5 kilometers long was made with the swimming pool built by King George at Kithara. The amount of water available at the present time is about 5 gallons per capita per day. The 22 artesian wells at Piraeus will be increased by ten more, all pumped by the air lift system.

The new conduits will supply from 40 to 50 gallons per capita per day to Athens and Piraeus. This is an adequate supply for these countries, which do not have such extensive consumption and waste of water as in the United States.

The entire work will be financed by a bond issue of the Hellenic Republic for $11,000,000. The work was let to Ulen & Company, New York City, Henry B. Ulen, President. The staff in Greece consists of Addison T. Ruan, General Manager, Merton R. Keefe, Manager of Construction, and R. H. Keays, Chief Engineer.

Resurfacing Old Brick Pavement in Waterloo, Iowa

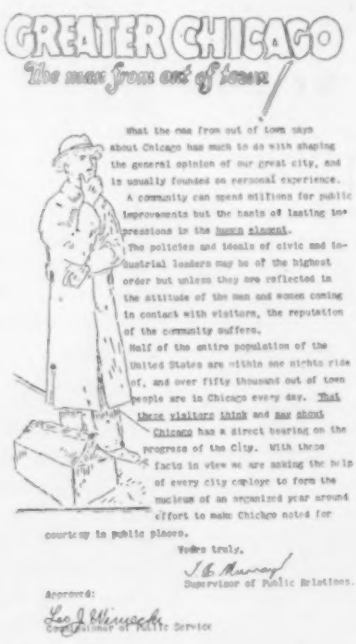
AT the Sixth Annual Conference, International Association of Street Sanitation Officials, Leon A. Link, Alderman, Waterloo, Iowa, reported that four or five miles of old brick paving in Waterloo were resurfaced four years ago and are still in very satisfactory condition. The brick, which had only a sand cushion, was cleaned thoroughly by means of a fire-hose and sweeping. Then, when dry, a binder course was laid on top of the brick, giving an even surface. On top of the binder course a 2-inch wearing surface of sheet asphalt was laid.

Procedure for Handling Discourtesy Complaints

A Statement Recently Issued by the Department of Public Service of the City of Chicago

IN accord with the policy of Mayor Dever to give the people of Chicago a clean, business-like administration of public affairs, the following method of procedure to bring about more cordial relations between municipal employees and citizens has been prepared.

The city of Chicago is identical with any other corporation organized for public service, except that the voting power for the selection of the executive head and legislative branch is based on citizenship instead of financial interest. Private enterprise has long appreciated good-will as an asset, and during the last decade there has been a consistent improvement in the methods pursued in handling the public. There is no logical reason why the men and women in public service should not be as courteous as those engaged by private enterprise, in fact, more so, as the basis of progress embracing increased compensation and better working conditions is usually a result of public sentiment, which, in turn, is shaped by the quality of service rendered and the impression created.


GREATER CHICAGO
The man from out of town
What the one from out of town says about Chicago has much to do with shaping the general opinion of our great city, and is usually founded on personal experience.
A community can spend millions for public improvements but the basis of lasting impressions is the human element.
The policies and ideals of civic and industrial leaders may be of the highest order but unless they are reflected in the attitude of the men and women coming in contact with visitors, the reputation of the community suffers.
Half of the entire population of the United States are within one night's ride of, and over fifty thousand out of town people are in Chicago every day. That these visitors think and say about Chicago has a direct bearing on the progress of the city. With these facts in view we are asking the help of every city employe to form the nucleus of an organized year around effort to make Chicago noted for courtesy to public places.
Yours truly,
Supervisor of Public Relations.
Approved:
Commissioner of Public Service

The value of this function of the municipal government, serving as a recognized agency for presenting the citizens' view-point, is not confined to, or limited by, the cases actually handled. The fact that such a vehicle exists will undoubtedly have the desired effect, and constructive criticism will be beneficial to all concerned.

Scope of Activity

This plan is not intended to interfere with or relieve department and bureau heads of the responsibility for the conduct and performance of employees under their supervision, and while a complaint-receiving agency has been established for the convenience of the public, the burden of courteous businesslike management of the various departments remains with the department head. When it is necessary for a citizen to make a justifiable complaint to the Department of Public Service, it is an indication of neglect of duty involving the supervisory force as well as the employee in question. In large cities the average citizen is dependent on public servants for information and guidance, and while each position has specific duties, there is one common obligation — prompt, courteous service.

Handling Complaints

1. The Department of Public Service, Bureau of Public Relations, will be the complaint-receiving agency (Room 613, City Hall), either by mail or in person.

2. The Bureau of Public Relations will take all details of the complaint on four copies and send three to the department head affected.

3. The department head will take such action as is necessary and render a report on two copies to the Department of Public Service within ten days, retaining one copy for departmental file.

4. The Department of Public Service will retain one copy for file and send one copy to the Civil Service Commission to be filed with employees' record.

5. The Department of Public Service will maintain a complete record of all complaints and render a summarized annual report to the Mayor December 1, and be prepared to give any other information the occasion demands.

Rochester Award for Civic Service

IN recognition of his contribution to medical knowledge and the relief of human suffering through the discovery of a cure and preventive measures for erysipelas, Dr. Konrad E. Birkhaug, of the staff of the University of Rochester School of Medicine and Dentistry, has received the Rochester Award of $500 and a diploma, presented by the Women's Educational and Industrial Union of that city.

This award, presented this year for the first time, was offered by the Union to the citizen of Rochester who should be adjudged by a representative committee of citizens as having performed the most outstanding service in any field for the city's best interest during 1925. About thirty nominations were made by various groups and individuals, the nominees including physicians, educators, scientists, municipal officers, social service workers, and political economists. An interesting result has been the bringing to light of important work by hitherto little-known persons.

The Women's Educational and Industrial Union hopes to establish the Rochester Award as an annual event.

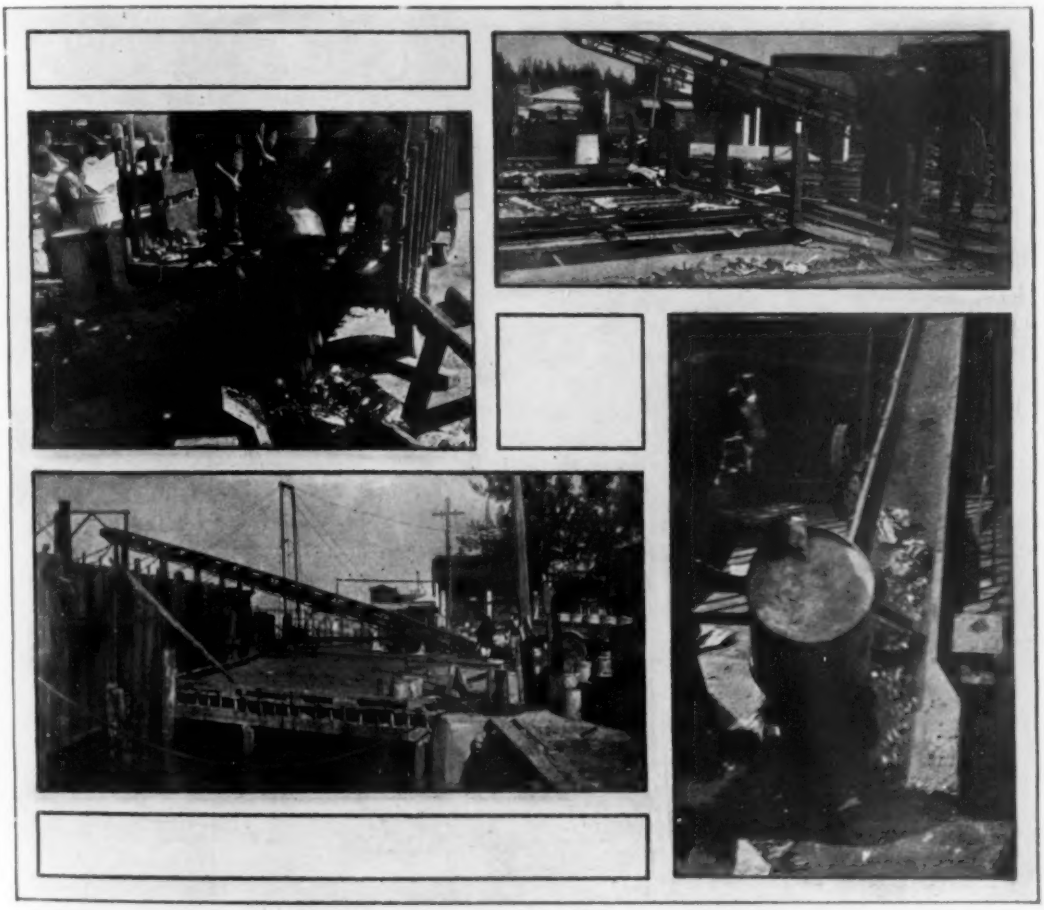
Garbage Disposal at Miami Beach, Florida

Novel Loading Scheme Uses Standard Equipment

THROUGHOUT the city of Miami Beach, Fla., garbage is collected daily. The city furnishes the garbage cans to the householders and collects them every day, replacing each filled can with an empty one. Garbage is disposed of by loading a scow which is towed out to sea about 15 miles and then dumped.

The problem of speedily loading the scow was solved in an interesting manner by E. R. Neff, City Engineer of Miami Beach, by using a 60-foot by 24-inch electrically driven Barber-Greene conveyor. Previous to the use of the conveyor, trucks were unloaded direct to the scow from the docks, but since the scow was usually much higher than the truck, this necessitated hand loading, which was slow, unsanitary, and expensive. Furthermore, only one side of the scow could be loaded by this method, and after the shoreward half of the scow was loaded the scow had to be turned around to come alongside the dock with its unfilled half against the dock. All of this time-consuming maneuvering has been eliminated by using the conveyor.

The trucks containing the filled cans drive up alongside the conveyor, and two men quickly empty the can onto the end of the con-



LOADING THE GARBAGE SCOW AT MIAMI BEACH, FLA.

Upper left.—Dumping can from truck onto conveyor. Upper right.—Upper end of conveyor dumping into scow. Lower left.—Conveyor, showing frame for lowering and raising conveyor as tide changes. Lower right.—Emptying cans from ground onto end of conveyor. These pictures were taken before the conveyor belt was covered with an arched sheet metal cover

veyor belt. The empty cans are then passed to another gang, who wash them with a 4-inch stream of water from a fire-hose. The cans are then returned and another load of filled cans collected.

The garbage is quickly carried up the belt without any spilling or sliding or rolling, even when the conveyor is elevated to 20 degrees. In order to take care of the rise and fall of tides, the conveyor is raised and lowered by a simple hand crank. The only trouble which has been experienced with the conveyor was that paper and light refuse was blown off the conveyor belt. This defect has been remedied by placing a half-circle sheet iron cover over the belt.

Saving Water by Eliminating Waste

By Harold J. Balliet

Former Deputy Commissioner of Public Works, Buffalo, N. Y.

VERY few citizens of Buffalo are aware of the fact that the Bureau of Water has a well-organized division that has to do with the elimination of water waste. The operation of the Pitometer Division has resulted in an enormous decrease in Buffalo's water consumption since its organization.

After a water waste survey, conducted by the Pitometer Company of New York City and lasting for two years, Water Commissioner George C. Andrews, formed, on July 1, 1919, a Pitometer Division of the Bureau of Water, with Leonard S. Spire in charge. This Division has functioned under the supervision of Mr. Spire since its inception.

History of Pitot Tube

In the year 1730 Monsieur Pitot, a French scientist and hydraulician, invented the Pitot tube, made of brass or copper, used for measuring the velocity of water in a pipe or stream. Within the past 25 years much improvement has been made in the practical application of the Pitot tube principle to the measurement of the flow of water.

A portable arrangement of the Pitot tube has been invented, called a rod meter, a glass U tube connected to the rod meter by suitable hose and a photographic recorder. The rod meter, to which have been attached Pitot tubes, is inserted into the mains through an attachment termed "street connection," and the deflection of the liquid in the U tube is photographed on sensitized paper in the photographic recorder. When these photo charts are interpreted, the consumption in a district or between any two valves is given.

The Pitometer Division, by use of its instruments, is able to make every part of the water system in Buffalo accessible, whether located above or below ground, to ascertain at all times what quantity of water is flowing through any water-main or into any portion of the city. By such a systematic application of these instruments all the loss of water, whether from large or from small openings, can be discovered and stopped.

Methods of Making Surveys

The city is divided into ten pitometer sections. These sections are divided into 79 subdivision districts. There are 147 gaging points installed with "street connections."

Since the organization of the Pitometer Division, in July, 1917, remarkable decreases in the water consumption have been made through a systematic campaign to stop all leaks and through prevention of wilful waste.

Results of Surveys

During the fiscal year 1916-1917 the combined pumpage of water of the two pumping-stations was 60,017,000,000 gallons, or 164,414,000 gallons a day, and with a population of 488,000 showed a daily per capita consumption of 337 gallons. The total pumpage of water for the fiscal year 1924-25, eight years after the organization of the Pitometer Division, was 42,984,000,000 gallons, a daily average of 117,764,000 gallons, and with a population of 565,000 the daily per capita consumption was 208.4 gallons. The total reduction in pumpage for the eight years was 17,033,000,000 gallons, or 49,460,000 gallons per day, or 133.6 gallons of water per day for each resident of the city. Approximately one ton of coal is used to pump a million gallons of water, and the direct benefit from the work of the Pitometer Division has been a reduction of coal, oil, and labor at the pumping-stations amounting to approximately $90,000 a year. The indirect benefits, such as postponing the time when larger feeder mains and additional pumping units will be needed, have amounted to several hundred thousand dollars in capital investments.

Leaking fixtures, promiscuous lawn sprin-

kling, and excessive waste of water by those who allow the water to run to waste to prevent freezing in the winter months are the principal causes of high pumpage.

During the fiscal year 1924-25, the inspectors in the Pitometer Division reported 23,572 fixture leaks and 1,742 service pipe leaks, a total of 25,314 leaks. Careful computation shows that the average amount of water wasted for each leak is 1,000 gallons of water a day, or a total, of all the leaks reported during the last fiscal year, of 17,235,000 gallons a day. The inspectors covered about one-half of the city during this period. If the property holders would use more care and repair the leaking fixtures as soon as they are discovered, the Water Bureau would save thousands of dollars yearly in its coal bill. The property holder who keeps his water fixtures repaired has to help pay for the water wasted by his neighbor who is careless and neglects to have the leaking fixtures repaired. When, after due notice is given of leaks and reasonable time allowed for repairs, the property holder fails to make the necessary repairs to stop the waste of water, a meter is installed and he is made to pay for all the water wasted.

The inspection of fixtures in residences, in many instances, may be an annoyance, but it is necessary to make continuous inspections in order to control the pumpage of water. Each inspector has a badge of identification and is specially trained in his work. He is instructed to be polite and courteous and to assist the property holders in any way, in order that the leaks may be immediately repaired and the waste stopped.

In order to let the public know how much water is wasted through leaking fixtures the following is presented:

A faucet leaking drop by drop will waste 15 gallons of water a day or 5,475 gallons a year.

Water leaking through a 1/16-inch opening will waste 800 gallons of water a day, or 290,000 gallons a year.

Water leaking through a 1-inch opening will waste 200,000 gallons of water a day, or 73,000,000 gallons a year.

Underground Leaks

Aside from accounting for water wasting though leaking fixtures, the pitometer locates all underground leaks which do not show upon the surface. It measures the amount of water wasting from broken mains, blow joints, leaking service pipes, etc.

Between 2,000,000 and 3 000,000 gallons of water a day in underground leaks have been located and stopped each year. Two instances of underground leaks located are mentioned here.

Fillmore Avenue between East Delavan and Appenheimer—a cracked 16-inch main wasting 250,000 gallons a day. The water from this leak was seeping through the rock soil into a quarry, and a trough had been built to catch the "spring water," which was used by the workmen for drinking purposes.

A 16-inch main in Elmwood Avenue lying under Scajaquada Creek was discovered leaking 184,000 gallons a day. The discovery of this necessitated the placing of a new section of main over the bridge.

These are but two of the many underground leaks discovered by the pitometer, and in each instance there was no indication of a leak on the surface. Repairs are always promptly made and the waste through the leaks stopped.

ACKNOWLEDGMENT.—Reprinted from *Buffalo Live Wire*, the official publication of the Buffalo Chamber of Commerce.

No Changes in Paving Brick Variety

THE Standing Committee on Paving Brick Simplification, functioning with the U. S. Department of Commerce, held its annual meeting in Washington the first of April. As a result of its deliberations, no changes were made in the present list of four recognized varieties. The survey of shipments in 1925 shows that of a total shipment representing 96 per cent of the tonnage capacity of the industry, of 353,600,000 brick, 74.2 per cent were in the four recognized varieties. Percentages for the individual sizes in 1924 and 1925 are shown in the following table:

SHIPMENTS OF RECOGNIZED VARIETIES OF PAVING BRICK IN PER CENT OF TOTAL SHIPMENTS

	Per Cent	
	1924	1925
Plain wire-cut		
3 x 4 x 8½ inches	43.1	40.7
3½ x 4 x 8½ inches	11.0	5.5
Repressed lug		
3½ x 4 x 8½ inches	22.0	21.0
Wire-cut lug (Dunn)		
3½ x 4 x 8½ inches	6.0	7.0
Total	82.1	74.2

Increased Use of Thin Brick

The decline in the percentage of shipments of recognized varieties is due to the increased demand for thinner brick. The 2½ x 4 x 8½-inch plain wire-cut brick, which is not a recognized variety, showed percentages of shipments in 1923 of 2.7 per cent, in 1924 of 4.4 per cent, and in 1925 of 8.9 per cent.

Because of the evident tendency toward the use of thinner brick, and because 2½-inch brick has so far stood up well in the brick road test now un-

der way by the Bureau of Public Roads at the Arlington Experiment Station, the Committee gave careful consideration to the advisability of declaring the 2½-inch brick a recognized variety. The Committee rules, however, provide that unless there are special reasons, a variety shall not be designated as "recognized" unless its shipments for three successive years have amounted to 5 per cent of the total. Lacking a unanimous vote, which the Committee's rules also require, the proposal to recognize the 2½-inch brick was lost. Because of the increased use of thinner brick, it is expected that the subject will come up again next year for discussion.

No Sizes Eliminated

The Committee's rules for eliminating a recognized variety require that the variety shall fall below 2½ per cent of shipments for three successive years. Since no variety came under this ruling and there were no special reasons for changes, no eliminations were made.

Building a Concrete Well at Summit, N. J.

By William Irving McMane

Vice-President, Commonwealth Water Company, Summit, N. J.

THE Commonwealth Water Company, a subsidiary of the American Water Works and Electric Company, Incorporated, operates in Union and Essex Counties, New Jersey. The company's territory is located in the metropolitan area and has experienced a rapid growth of population recently.

The source of supply is from wells. During the year 1925 a new 32-inch concrete well was constructed by the Kelly Well Company. This type of well was adopted in preference to the steel-casing well because of its greater expected life.

In the construction of this well, a light steel casing was used to prevent caving during the drilling. The first section of the casing was 54 inches in diameter and about 20 feet long. As the drilling proceeded, other sections of the casing, smaller in size, were installed within the larger casing to a total depth of 135 feet. When the drilling was completed, the work of installing a concrete plug in the bottom of the well was begun. This plug was cast on the surface and had four holes to receive steel cables. In each section of the screen and well pipe, holes were cast and the sections placed and lowered on cables, which kept the screen and pipe in alignment, resting firmly on the concrete plug at the bottom of the well. The annular space between the concrete screen and the steel casing was then filled with selected sand and gravel, forming a filter bed around the screen. This filter bed is coarser than the water-bearing strata.

The effective size for this well is 38 inches. The outside diameter of the screen is 32 inches and the length 75 feet. The inside diameter of the screen and well pipe is approximately 25 inches. This well installed by the Commonwealth Water Company has delivered 1,500 gallons per minute without lowering the water plane excessively.

TESTING THE NEW KELLY WELL OF THE COMMONWEALTH WATER COMPANY

Minimum Rates and Service Charges for Water-Meters—Part I

Prepared from Signed Reports from Water-Works Officials

ARKANSAS

Fort Smith

The minimum monthly rate for all metered water service shall be as follows:

⅝- and ¾-inch meters	$0.75
1-inch "	1.00
1¼- and 1½-inch "	1.50
2-inch "	2.00
Meters over 2 inches	2.50

Each consumer served through a meter shall be entitled to the use of 112 cubic feet of water for each 25 cents paid under the minimum rates above specified. In cases where the meter reading shows a greater amount of water consumed than is allowed under the minimum charge, the following schedule of rates or prices shall be charged in proportion to the water used:

First 4,000 cu. ft.	22½¢ per 100 cu. ft.
Next 4,000 " "	18½¢ " " " "
" 4,000 " "	13½¢ " " " "
" 4,000 " "	10½¢ " " " "
Over 16,000 " "	7½¢ " " " "

Five per cent. discount on all bills if paid within 10 days after they become due.

Helena

Meter Rates

First 3,333 cu. ft.	37½¢ per 100 cu. ft.
Next 6,666 " "	30¢ " " " "
" 13,333 " "	20¢ " " " "
" 16,666 " "	15¢ " " " "
Over 40,000 " "	7½¢ " " " "

Monthly Minimum Charges

⅝- and ¾-inch meters	$1.25
1-inch "	1.50
1½-inch "	2.00
2-inch "	5.00
Meters over 2 inches	10.00

CALIFORNIA

Alhambra

Service through ⅝-inch meters furnished by the Water Department or through any size meter owned by consumer:

First 800 cu. ft.	$1.00 per mo. min.
Next 9,200 " "	10¢ per 100 cu. ft.
" 40,000 " "	8¢ " " " "
Over 50,000 " "	5¢ " " " "

Minimum charge per month for service through larger meters furnished by the Water Department, with excess charged as above:

¾-inch meter,	800 cu. ft.	min.	$1.25
1-inch "	800 " "	"	1.50
1½-inch "	1,500 " "	"	2.00
2-inch "	2,000 " "	"	2.50

Benicia

Monthly Meter Rates

First 300 cu. ft.	55¢ per 100 cu. ft.
Next 700 " "	48¢ " " " "
" 4,000 " "	43¢ " " " "
" 5,000 " "	38¢ " " " "
Over 10,000 " "	33¢ " " " "

Monthly Minimum Charges

⅝-inch meter	$1.65
¾-inch "	2.25
1-inch "	3.00
1½-inch "	5.00
2-inch "	10.00
3-inch "	20.00
4-inch "	35.00
6-inch "	65.00

Lindsay

Meter Rates

⅝- or ¾-inch meter	$1.00
1-inch "	1.25
1½-inch "	1.50
2-inch "	2.00
3-inch "	3.00
Next 100,000 gals.	12¢ per 1,000 gals.
Over 105,000 "	10¢ " " "

Monthly Minimum Charges
(Allowing 5,000 gals.)

Escondido

Every consumer of water using a water-meter shall pay 10 cents for every 1,000 gallons or part thereof used, provided that the minimum monthly rate for water through a meter, to be known as a service charge, payable monthly in advance, shall be as follows:

¾-inch meter	$1.75
1-inch "	2.50
1½-inch meter	$3.50
2-inch "	6.00

Every consumer who shall pay said service charge and also for the water used on or before the 10th of the month following the term same shall become due and payable, shall be entitled to and allowed a discount as follows:

⅝-inch meter	$0.25
1-inch "	.50
1½-inch "	.50
2-inch "	1.00

And provided further that there shall be no discount allowed on the amount due for the water used.

Long Beach

Meter Rates

First 1,000 cu. ft.	15c per 100 cu. ft
Next 4,000 " "	10¢ " " " "
" 10,000 " "	8¢ " " " "
" 10,000 " "	7¢ " " " "
" 75,000 " "	6¢ " " " "
Over 100,000 " "	5¢ " " " "

Monthly Minimum Charges

¾-inch meter	$0.75
1-inch "	1.00
1½-inch "	1.50
2-inch "	2.00
3-inch "	4.50
4-inch "	9.50

Los Angeles

Monthly Meter Rates

First 10,000 cu. ft.	13¢ per 100 cu. ft.
Next 40,000 " "	11¢ " " " "
" 50,000 " "	9¢ " " " "
Over 100,000 " "	7¢ " " " "

Monthly Minimum Charges

⅝, ¾ or 1-inch meter	$1.00
1½-inch "	1.50
2-inch "	2.00
3-inch "	3.00
4-inch "	4.00
6-inch "	6.00

Monterey, Pacific Grove, Carmel, and Pebble Beach

Monthly Meter Rates

First 300 cu. ft. or less	$1.10
Next 700 " "	30¢ per 100 cu. ft.
Over 1,000 " "	25¢ " " " "

Monthly Minimum Charges

½- or ¾-inch service	$1.10
1-inch "	1.50
1½-inch "	2.25
2-inch "	3.00
3-inch " or larger	4.00

Oakland, Berkeley, Alameda, Richmond, Piedmont, Albany Emeryville, El Cerrito, San Leandro, Newark, and portions of Alameda and Contra Costa Counties

Monthly Service Charges

⅝-inch meter	$0.50
¾-inch "	1.00
1-inch "	1.50
1½-inch "	2.50
2-inch "	4.50
3-inch "	8.00
4-inch "	12.50
6-inch "	25.00

The above rates will be applied monthly, according to size of meter, in addition to monthly charge for water used at rates below:

First 50,000 cu. ft.	23¢ per 100 cu. ft.
Over 50,000 " "	19¢ " " " "

Pinole and Hercules

A readiness-to-serve charge of 50 cents per month on domestic services will be applied in addition to monthly charge for water used at rates below:

First 300 cu. ft.	25¢ per 100 cu. ft.
Over 300 " "	20¢ " " " "

There is also a flat rate charge for the Hercules Cottages of $1.25 per month, including the service charge.

San Bernardino

Monthly Minimum Charges

½-inch meter	$1.25	for	1,500 cu. ft.
¾-inch "	1.90	"	2,400 " "
1-inch "	2.50	"	3,100 " "
1½-inch "	3.75	"	4,800 " "

2-inch meter	5.00	for	6,300 cu. ft.
3-inch "	7.50	"	9,400 " "
4-inch "	10.00	"	12,500 " "
6-inch "	15.00	"	18,800 " "

For consumption in excess of above amounts, the following rates apply:

First 50,000 cu. ft.	80¢	per	1,000 cu. ft.
Next 10,000 " "	79¢	"	" "
" 10,000 " "	76¢	"	" "
" 10,000 " "	73¢	"	" "
" 10,000 " "	70¢	"	" "
" 10,000 " "	68¢	"	" "
" 25,000 " "	65¢	"	" "
" 25,000 " "	62¢	"	" "
" 25,000 " "	59¢	"	" "
" 25,000 " "	56¢	"	" "
" 25,000 " "	53¢	"	" "
" 25,000 " "	50¢	"	" "
" 25,000 " "	47¢	"	" "
" 475,000 " "	44¢	"	" "
" 750,000 " "	41¢	"	" "
" 1,500,000 " "	37¢	"	" "
" 1,000,000 " "	34¢	"	" "
" 2,000,000 " "	31¢	"	" "
Over 6,000,000 " "	26¢	"	" "

San Buena Ventura

Monthly Meter Rates

First 500 cu. ft.	22¢	per	100 cu. ft.
Next 500 " "	17¢	"	" "
" 10,000 " "	11¢	"	" "
" 20,000 " "	9¢	"	" "
Over 31,000 " "	5¢	"	" "

Monthly Minimum Charges

⅝-inch meter	$1.10
¾-inch "	1.40
1-inch "	1.95
1½-inch "	2.75
2-inch "	3.30
3-inch "	4.40
4-inch "	5.50

San Francisco

Monthly Meter Rates

First 3,300 cu. ft.	28.8¢	per	100 cu. ft.
Next 30,000 " "	25.2¢	"	" "
" 33,300 " "	21.6¢	"	" "

Monthly Service Charges

⅝-inch meter	$0.78
¾-inch "	1.20
1-inch "	1.80
1½-inch "	3.00
2-inch "	5.40
3-inch "	9.60
4-inch "	15.00
6-inch "	30.00
8-inch "	48.00

San Mateo

Monthly Meter Rates

First 3,000 cu. ft.	25¢	per	100 cu. ft.
Over 3,000 " "	22¢	"	" "

Monthly Service Charges

⅝- or ¾-inch meter	$0.50
1-inch "	1.25
2-inch "	3.00
3-inch "	4.50
4-inch "	6.00

San Rafael
Marin Municipal Water District

Monthly Minimum Charges
(with allowance of 300 cu. ft.)

⅝-inch meter	$1.50
¾-inch "	1.75
1-inch "	2.25
1½-inch "	3.25
2-inch "	5.25
3-inch "	8.75
4-inch "	13.25

Meter Rates

Next 9,700 cu. ft.	25¢	per	100 cu. ft.
" 350,000 " "	23¢	"	" "
Over 360,000 " "	21½¢	"	" "

Santa Barbara

Monthly Minimum Charges

⅝-inch meter	$1.00	for	1,000 cu. ft.
¾-inch "	1.30	"	1,200 " "
1-inch "	1.60	"	1,400 " "
1½-inch "	1.90	"	1,600 " "
2-inch "	2.20	"	1,800 " "

Meter Rates

Above to 4,000 cu. ft.	15¢	per	100 cu. ft.
Next 21,000 " "	12¢	"	" "
Over 25,000 " "	9¢	"	" "

Santa Paula

Monthly Minimum Charges

⅝-inch meter	$1.00
¾-inch "	1.50
1 inch "	$2.00
1½-inch "	3.25
2-inch "	5.00
3-inch "	8.00
4-inch "	12.00

Each of the above monthly minimum charges will entitle the consumer to the quantity of water which that minimum charge will purchase at the following monthly meter-rates:

First 700 cu. ft.	$1.00		
Next 4,300 " "	10¢	per	100 cu. ft.
" 5,000 " "	7¢	"	" "
Over 10,000 " "	5¢	"	" "

Sausalito

Monthly Minimum Charges
(including 400 cu. ft.)

⅝-inch meter	$1.50
¾-inch "	1.75
1-inch "	2.25
1½-inch "	3.25
2-inch "	5.25
3-inch "	8.75
4-inch "	13.25

Meter Rates

Next 32,000 gals.	50¢	per	1,000 gals.
Next 15,000 "	45¢	"	" "
Over 50,000 "	40¢	"	" "

Sonora

Monthly Meter Rates

First 500 cu. ft.	25¢	per	100 cu. ft.
Next 2,500 " "	15¢	"	" "
Over 3,000 " "	5¢	"	" "

Monthly Minimum Charges

⅝-inch meter	$1.25
¾-inch "	1.50
1-inch "	2.00
1½-inch "	2.50
2-inch "	3.00
3-inch "	4.00
4-inch "	5.00

Willits

Monthly Meter Rates

First 500 cu. ft.	25¢	per	100 cu. ft.
Over 500 " "	10¢	"	" "

Monthly Minimum Charges

⅝-inch meter	$1.25
¾-inch "	1.50
1-inch "	2.00
1½-inch "	3.00
2-inch "	4.00
3-inch "	7.00
4-inch "	10.00

COLORADO

Grand Junction

Meter Rates

First 6,000 gals.	17½¢	per	1,000 gals.
Next 44,000 "	16¢	"	"
" 50,000 "	15¢	"	"
" 300,000 "	12¢	"	"
" 600,000 "	10¢	"	"
" 1,000,000 "	8¢	"	"
Over 2,000,000 "	5¢	"	"

Monthly Meter Rentals

⅝ x ¾-inch meter	$0.20
¾-inch "	.25
1-inch "	.30
1¼- or 1½-inch "	.50
2-inch "	.75
3-inch "	1.00
4-inch "	2.00
6-inch "	4.00

CONNECTICUT

Ansonia

Quarterly Meter Rates

First 10,000 cu. ft.	14½¢	per	100 cu. ft.
Next 90,000 " "	12¢	"	" "
" 150,000 " "	9¢	"	" "
Over 250,000 " "	6½¢	"	" "

Quarterly Fixed Service Charges

⅝-inch meter	$1.05
¾-inch "	2.25
1-inch "	5.40
1½-inch "	13.50
2-inch "	18.00
3-inch "	43.50
4-inch "	63.00
6-inch "	118.50
8-inch "	190.50
10-inch "	216.00

Bridgeport, Stratford and Fairfield

Quarterly Meter Rates

First 7,000 cu. ft.	13½¢	per	100 cu. ft.
Next 10,000 " "	11¢	"	" "
" 10,000 " "	9¢	"	" "
" 13,000 " "	7¢	"	" "
Over 40,000 " "	6¢	"	" "

QUARTERLY MINIMUM CHARGE

⅝-inch meter	$2.50	for	1,850 cu. ft
¾-inch "	3.00	"	2,222 "
1-inch "	4.00	"	2,962 "

Putnam

DAILY METER RATES

First 1,000 gals.	25¢	per 1,000 gals.
Next 4,000 "	20¢	" " "
" 5,000 "	17½¢	" " "
" 10,000 "	15¢	" " "
Over 20,000 "	12½¢	" " "

ANNUAL MINIMUM CHARGES

¾-inch and under	$12.50
1-inch meter	15.00
1½-inch "	17.50
2-inch "	25.00

Southington

QUARTERLY METER RATES

First 5,000 cu. ft.	22¢	per 100 cu. ft.
Next 10,000 " "	12¢	" " "
" 85,000 " "	8½¢	" " "
Over 100,000 " "	6¢	" " "

QUARTERLY METER RENTALS

⅝-inch meter	$0.50
¾-inch "	.70
1-inch "	.90
1¼-inch "	1.20
1½-inch "	1.50
2-inch "	2.50
3-inch "	5.00
4-inch "	10.00

Thompsonville

QUARTERLY METER RATES

First 40,000 gals.	33¢	per 1,000 gals.
Next 160,000 "	25¢	" " "
Over 200,000 "	15¢	" " "

QUARTERLY MINIMUM CHARGES

⅝-inch meter	$3.50
¾-inch "	4.25
1-inch "	5.50
1½-inch "	6.75
2-inch "	8.00

DELAWARE

Wilmington

QUARTERLY METER RATES

First 2,000 cu. ft.	75¢	per 1,000 cu. ft.
Next 3,000 " "	60¢	" " "
Over 5,000 " "	55¢	" " "

MINIMUM CHARGES

⅝-inch meter	$10.00
¾-inch "	15.00
1-inch "	20.00
1½-inch "	30.00
2-inch "	40.00
3-inch "	50.00
4-inch "	60.00
5-inch "	70.00
6-inch "	80.00

GEORGIA

Griffin

MONTHLY METER RATES

First 50,000 gals.	19¢	per 1,000 gals.
Next 450,000 "	16¢	" " "
Over 500,000 "	14¢	" " "

MONTHLY MINIMUM CHARGES

⅝-inch meter	$1.00
¾-inch "	1.25
1-inch "	1.50
1½-inch "	1.75
2-inch "	2.50
3-inch "	4.00
4-inch "	5.00
6-inch "	7.00

Rome

METER RATES

First 50,000 gals.	20¢	per 1,000 gals.
Next 50,000 "	17½¢	" " "
" 50,000 "	15¢	" " "
Over 150,000 "	12½¢	" " "

MONTHLY MINIMUM CHARGES

⅝-inch meter	$1.00
¾-inch "	1.25
1-inch "	1.50
1½-inch "	5.00
2-inch "	10.00
3-inch "	20.00
4-inch "	30.00
6-inch "	40.00

IDAHO

Salmon

MONTHLY METER RATES

First 1,000 gals.	$1.00	per 1,000 gals.
Next 2,000 "	44¢	" " "
" 2,000 "	36¢	" " "
" 5,000 "	28¢	" " "
" 10,000 "	16¢	" " "
" 10,000 "	12¢	" " "
" 20,000 "	10¢	" " "
" 50,000 "	9¢	" " "
" 100,000 "	8¢	" " "
" 300,000 "	7¢	" " "
" 500,000 "	6½¢	" " "
" 2,000,000 "	6¢	" " "
" 3,000,000 "	5½¢	" " "

MONTHLY METER RENTALS

⅝-, ¾- or 1-inch meter	$0.25
1¼-inch "	.50
1½-inch "	.75
2-inch "	1.00
2½-inch "	1.50

ILLINOIS

Dixon

MONTHLY METER RATES

First 1,000 cu. ft.	28¢	per 100 cu. ft.
Next 10,000 " "	21¢	" " "
Over 11,000 " "	13½¢	" " "

MONTHLY SERVICE CHARGES

⅝-inch meter	$0.25
¾-inch "	.35
1-inch "	.50
1½-inch "	.75
2-inch "	1.50
4-inch "	5.00
6-inch "	10.00

If bill is paid within ten days after rendition, a discount of 2½ cents on each 100 cubic feet of water is allowed.

Evanston

QUARTERLY METER RATES

First 10,000 cu. ft.	12¢	per 100 cu. ft.
Next 15,000 " "	10¢	" " "
" 25,000 " "	8¢	" " "
Over 50,000 " "	7¢	" " "

A semi-annual service charge of $1.50 to consumers of metered water is made.

Lincoln

METER RATES

First 1,000 cu. ft.	20¢	per 100 cu. ft.
Next 99,000 " "	9½¢	" " "
Over 100,000 " "	5¢	" " "

MONTHLY MINIMUM CHARGES

⅝-inch meter	$0.67
¾-inch "	1.15
1-inch "	2.30
1½-inch "	4.60

Moline

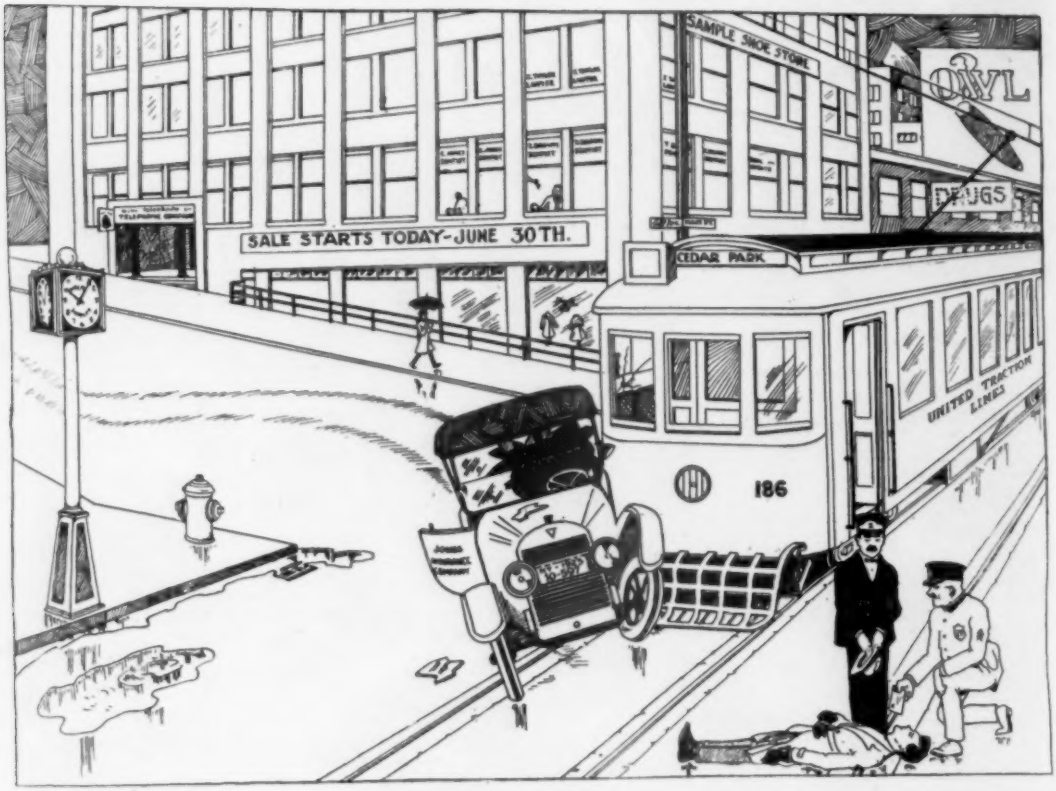
QUARTERLY METER RATES

First 15,000 gals.	20¢	per 1,000 gals.
Next 15,000 "	18¢	" " "
Over 30,000 "	15¢	" " "

QUARTERLY MINIMUM CHARGES

⅝-inch meter	$2.25
¾-inch "	3.00
1-inch "	3.75
1¼-inch "	4.50
1½-inch "	5.50
2-inch "	10.00
3-inch "	15.00
4-inch "	20.00
6-inch "	30.00

Additional Reports of Minimum Rates and Service Charges for Water-Meters will appear in the July and August issues of THE AMERICAN CITY.



Testing the Accuracy of Observation of Patrolmen in Automobile Accidents

DIRECTIONS TO THE EXAMINER: Pass out the prints showing the drawing of the automobile which has been struck by a street car, placing a print face down on the desk in front of each competitor. Secure the attention of the competitors and make some such announcement as this:

"The sheet face down on the desk before you is a drawing of an automobile accident. When I give you the signal you are to turn over this sheet and study all you see in the drawing for 1½ minutes. Later the drawing will be taken up and you will be asked to answer 15 questions about the accident. These 15 questions will be about such things as the time and place of the accident, how it occurred, what damage was done, and other facts such as a patrolman ought to note so he can make his report to his superior officer. If you wish to, you may make notes about the things you see in the drawing and use these notes in answering the questions which will be asked you later. Remember that you are to have just 1½ minutes to study the drawing and that you will have to answer 15 questions about the drawing from memory or from your notes. Are you ready?"

When all are ready, have them turn over the print containing the drawing and allow them to study it for 1½ minutes. Then collect the prints. Next have the competitors turn to the first page in the booklets and answer the following fifteen questions (see that they do not see the questions until the prints are collected). After seven minutes give the signal to stop.

Directions: Answer the following questions, in the blank spaces, concerning the picture you have just examined:

1. At what street intersection did the accident occur?
2. What is the condition of the weather?
3. From what state is the automobile?
4. On which side was the automobile struck?
5. About what hour of the day did the accident occur?
6. Name three ways in which the automobile was damaged?
7. What is the number of the street car?
8. To whom does the automobile belong?
9. Name two things which show the driver lost control of the automobile.
10. What is the route of the street car?
11. What is the number of the street car employee?
12. What is the date of the accident?
13. Name two things which indicate that the chauffeur was killed rather than only injured.
14. Who is the first person you would call as a witness of the accident?
15. How is the policeman attempting to identify the chauffeur?

Methods of Selecting More Efficient Patrolmen

Tests Suggested by the Bureau of Public Personnel Administration

ANYBODY familiar with the facts cannot doubt that a higher grade of mentality is today being demanded of recruits for the police service than ever before in the United States. This movement has undoubtedly advanced farthest in Berkeley, Calif., where August Vollmer, Chief of Police, gives the army alpha intelligence tests to would-be patrolmen and rejects those who fail to make a minimum score of 135, which is the lower limit of the A group (constituting a little less than five per cent of the population) and which is about the median score made by college students.

In other cities the requirements are as yet not so high as in Berkeley, but to the staff of the Bureau of Public Personnel Administration it appears indisputable that there is a general movement to raise the mental standards and that in a number of cities—mostly the smaller ones—this movement is quite rapid. It follows too, as day follows night, that when more attention is paid to the mental attainments of those seeking positions as patrolmen, less emphasis is placed upon the almost impossibly high physical standards hitherto observed. This does not mean that a good physique is not valuable and essential in a patrolman, but it does mean that mere height, upstanding carriage, and good muscular development are not likely to be accepted in lieu of native intelligence which is supplemented by a reasonable amount of education and a willingness to make the most of natural endowments.

The advantages of giving the mental tests before the medical and physical tests are great and obvious. Then mental tests can be much more easily, cheaply, and quickly given and scored than the medical and physical tests, and, therefore the employment list can be established with great economy of both time and money. The mental tests, moreover, apparently constitute a safer basis for weeding out the unfit than any medical and physical tests that have yet been devised. Civil service administrators, however, have been very slow to change their established practice, which is to give the medical and physical tests first and then to give the mental tests to those who survive that ordeal. The staff of the Bureau of Public Personnel Administration is thoroughly convinced, from close observation of both methods, that best results will be secured if the age, weight, and height requirements are clearly and definitely stated in the public announcement of the tests; if those who obviously fail to meet the age, weight, and height requirements are rejected at the time the application is made; if devices to measure the height and weight roughly are available at the time the mental tests are given, so that those who were ignorant of or who misrepresented their weight and height can be eliminated as they go into the examination room for the mental tests; if the mental tests are given ahead of the medical and physical tests; and if only those who make satisfactory scores in the written tests are summoned for an interview and for detailed medical and physical tests.

Higher Mental Standards for Patrolmen

In cooperation with many civil service administrators, chiefs of police, psychologists, and others, the Bureau of Public Personnel Administration has issued, in the April, 1926, issue of "Public Personnel Studies," an exceedingly valuable set of partially standardized tests for patrolmen. The accompanying article comprises portions of two of the eleven tests and quotations from the introductory paragraphs of the report. The complete document is obtainable from the Bureau at its Washington office, 26 Jackson Place.

Duties and Qualifications of Patrolmen

The tests under discussion have been constructed not for use in selecting such special police officers as those assigned to the traffic squad, to the vice squad, to detective work, or to service on horseback or motorcycle, but for the patrolman who is assigned a beat which he walks on foot or covers by automobile. Specifically, the duties and qualifications are assumed to be as follows:

DUTIES: Under supervision, to be responsible, during a definite watch or period, for the prevention of crime and disorder, the preservation of law and order, and the protection of

life and property within an assigned territory or beat; to arrest violators of the law and to assist in their prosecution in the courts; to make reports; to serve writs; and to perform related work as required.

EXAMPLES OF TYPICAL TASKS: Maintaining order; giving help and information to citizens; giving first aid to sick or injured persons, noting and reporting accidents, suspicious circumstances, or dangerous or defective conditions of public or private property; giving advice and assistance to persons in trouble; preventing the committing of unlawful acts; apprehending and arresting criminal, insane, or other persons menacing the safety of the public; taking charge of lost children; enforcing automobile parking ordinances; serving warrants, subpoenas, and other writs; escorting parades; apprehending violators of automobile parking and speed regulations; bringing prisoners to a station house.

MINIMUM QUALIFICATIONS: Elementary school education; intelligence equal to or greater than that indicated by a score of 65 in the army alpha intelligence tests; ability to comprehend and carry out instructions and to make simple written reports; ability to understand, interpret, and apply laws, ordinances, and police regulations and rules; ability to size up situations and people and to deal with people individually and in groups; keen observation; even temperament; good moral character; good physical condition; strength; agility; height not less than 66 inches; weight not less than 132 pounds and properly proportioned to height; age not less than 21 years and not more than 29 years.

DESIRABLE ADDITIONAL QUALIFICATIONS: Education equivalent to that required for graduation from high school and preferably college training; experience as a member of an organization in which there is contact with considerable numbers of people of different kinds; abstract intelligence equal to or greater than that indicated by a score of 105 in the army alpha intelligence tests; knowledge of criminology and of social problems.

These qualifications, it should be remembered, are for patrolmen who act as police officers in uniform, who are customarily armed with a revolver or baton, or both, who have a mass of laws, ordinances, and police rules, regulations, and policies to understand and apply, who have the right to deprive citizens of their liberty and in some cases to take their lives, and who in general represent and maintain the majesty of the law.

Police Duties

This section of the tests contains twenty questions for each of which four answers are suggested. Before each answer is a space in which to make a mark. The person being examined is asked to read over the four answers and then to place a cross (X) in the space before the answer which is best or most nearly correct. He is told, "Do not place a cross (X) before more than one answer under each question; if you do, your work on that question will not be counted. Only one of the four answers is the best one and you are to show by the cross (X) which it is."

Typical questions in this section are:

1. When a man gives a juror $500 to vote for acquittal, his offense is called:
   ..... Contempt of court
   ..... Bribery
   ..... Malfeasance
   ..... Blackmail
2. If the arm of a man is badly cut in an automobile wreck so that bright blood spurts out, the best way to stop the bleeding is:
   ..... To tie a handkerchief loosely around the bare arm above the cut, place a stick under the handkerchief, and twist the stick until the handkerchief becomes tight.
   ..... To tie a handkerchief loosely around the bare arm below the cut, place a stick under the handkerchief, and twist it until the handkerchief becomes tight.
   ..... To give the man a liberal amount of stimulant.
   ..... To take the hand and hold the two lips of the wound together, pressing down on it at the same time to stop the bleeding.
4. A patrolman may use force in making an arrest if:
   ..... The person to be arrested looks at him in a sneering manner.
   ..... The person to be arrested resists or seems likely to escape.
   ..... He thinks a hooting crowd nearby should be impressed with the power of the law.
   ..... The person to be arrested seems to offer no resistance but has put up a stiff fight before when arrested.
8. A patrolman is justified in shooting to kill:
   ..... If he sees a man entering a house through a window at night.
   ..... If he sees a man leave an unoccupied house at night and the man runs when ordered to halt.
   ..... If a man whom he is attempting to arrest starts toward him with a large hammer, threatening him with it.
   ..... If a big man has a little man down beating him with his fists and when the officer orders him to let go, the big man curses and keeps on.
11. The best way to handle the traffic problem is:
   ..... To make arrests every time the law is

clearly violated, regardless of circumstances.

.....To educate the public in safety rules, secure their cooperation in enforcing the law, and arrest those who refuse to observe the law.

.....To make the legal speed limit for automobiles not more than fifteen miles an hour in the city limits.

.....To prohibit women and minors from driving automobiles.

14. If an officer sees a man picking someone's pocket, he should:

.....Get a warrant for the man's arrest.

.....Arrest the man immediately without a warrant.

.....Take the man to the station, provided the person whose pocket he was picking agrees to go along and swear out a warrant.

.....Wait until the pickpocket secures the man's purse and then arrest him.

Other Tests in the Series

The foregoing questions comprise a portion of test 3. Questions to determine accuracy of observation from test 1 appear on page 616. The other nine tests in the complete set published in *Public Personnel Studies* cover memory; identification of crimes; social intelligence; interpretation of laws, ordinances, police rules and regulations and other printed material; abstract intelligence; education and experience; personal traits as determined by an interview; medical and physical tests, and character investigation.

Civic Art in Buffalo

FOR the photograph reproduced on the front cover of this issue, THE AMERICAN CITY is indebted to the Buffalo Chamber of Commerce. Buffalo is given this place of honor not only because of the attractiveness of the Lafayette Square picture, but also because of the fact that Buffalo is to be the host this month of one of the most important conventions in the municipal field—the annual meeting of the American Water-Works Association.

Another excellent example of civic art in Buffalo, reproduced below, is the Albright Art Gallery. This building is regarded by many as the finest type of Grecian architecture in North America.

THE ALBRIGHT ART GALLERY, ONE OF THE BEAUTIFUL MUNICIPAL BUILDINGS OF BUFFALO, N. Y.

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Slum Clearance Policy Adopted by New York State

THE New York State Legislature has enacted a housing law designed to enable private enterprise to build tenements that may be offered at rentals within the means of wage-earners in congested areas of the state. Though it is a compromise measure which does not give all that he asked, Governor Smith has signed the bill. Thus, after a half-century of agitation against the evils of the slums, New York is taking its first practical step toward their abolition. The new housing law declares that "congestion and unsanitary housing conditions which exist in certain areas of the state in low-priced dwellings are a menace to the health, safety, morals, welfare, and reasonable comfort of the citizens of the state." It further declares that, "correction of these conditions in such areas being now otherwise impossible, it is essential that provision be made for the investment of private funds at low interest rates and acquisition at fair prices of adequate parcels of land, the gradual demolition of existing unsanitary and unsafe housing, and the construction of new housing facilities under public supervision in accord with proper standards of sanitation and safety." Under the terms of the act the rents to be charged in such dwellings are to be limited by maxima ranging from $9.00 to $12.50 per room per month, according to location. A State Board of Housing is created to select and to approve areas in which construction may be undertaken by the "public" or "private" limited dividend corporations authorized in the law, and for the execution of projects.

A Constructive Program for Housing Relief

"There are two essentials to an effective program for housing relief:

"1. The gradual reconstruction of the worst tenement areas in cities.

"2. The adoption of a method of providing adequate housing for families of limited income which commercial enterprise cannot serve, applicable not only to the worst tenement areas but as well to any part of a city or cities in which the need is manifest.

"Any effective program will require adequate safeguard by municipal authorities through exercise of powers now granted. Housing must be planned with relation to location of industry, transit facilities, and physical characteristics of the metropolitan area. Adequate zoning provisions are essential. The housing must be provided by some agency operating without speculative profit, under public control, with money at a low rate of interest, aided by the exercise of the power of condemnation, producing on a large scale with efficient organization and management."

—From Legislative Document (1926) No. 66 of the State of New York, comprising the Report of the Commission of Housing and Regional Planning for Permanent Housing Relief, and a Message from the Governor.

Under the terms of the act the public limited dividend housing companies are required to limit their stock dividends to 6 per cent, and are permitted to pay not more than 5 per cent interest on funds raised by first mortgage on the entire property. They are required to provide, by the issuance of stock, one-third of the actual cost of any approved project. After the project is approved, public limited dividend companies may exercise the power of condemnation to acquire land, but they are not permitted to alienate such land except through sale to another public limited dividend company similarly organized with the approval of the Board. Furthermore, they are required to provide for the amortization of the bonded indebtedness as may be required by the State Board of Housing. They are permitted to acquire a reserve equal to 12 per cent of the outstanding capital stock, and the amount of the net earnings transferable to surplus in any year is subject to the approval of the State Board of Housing. All gross receipts in excess of current expense for operation, taxes, interest, dividends, amortization, and authorized surplus must be applied to the reduction of rentals. Such companies may not voluntarily dissolve without having obtained the consent of the State Board of Housing.

The act gives to public limited dividend companies exemption from the payment of all franchise, organization, income, mortgage, recording, and other taxes of the state; and their bonds and mortgages are declared to be

instrumentalities of the state, issued for public purposes and, together with the interest thereon, exempt from taxation. Furthermore, municipalities in which projects are undertaken are authorized to exempt the buildings and improvements from local taxation, provided that the buildings are erected before January 1, 1937.

Private limited dividend companies are not permitted to exercise the right of condemnation in acquiring property and are not restricted in the sale of their holdings. They may limit their stock dividends to 7 per cent and the provisions exempting the buildings and improvements of such companies from taxation apply only so long as the property is owned, managed, and operated by limited dividend companies. The securities of the private limited dividend companies are not instrumentalities of the state, but are exempt from taxation by the state both as to principle and income.

Restrictive Measures Had Not Solved the Housing Problem

The enactment of this legislation is an outgrowth of the housing crisis that followed the war. The Reconstruction Commission, the Lockwood Committee, and the Commission of Housing and Regional Planning which has replaced them and continued their work in this particular field, all found that the housing emergency was only the intensification of a long-standing evil. While recommending the protection of tenants from unreasonable and unjust increases in rents, they recognized such legislation to be only palliative, pointing out repeatedly that the only real solution to the problem lay in getting low-rental houses built.

The imperative need for relief and the impossibility of relief through the operation of unaided commercial enterprise were most clearly set forth in the report which the Commission of Housing and Regional Planning presented to the Legislature in February along with its concrete proposals. Though the measure as finally passed differs in important respects from the one sponsored by the Commission, the report remains its inspiration and its constitutional justification.

Summarizing the results of investigation after investigation in New York and other cities of the state since the middle of the 19th century, during which time the permanent features of the housing problem had been recognized, the report demonstrated that neither the awakening public conscience nor housing legislation have brought any substantial housing relief to the majority of urban families. Tracing the increasing congestion especially in the past decade, with its effect upon public health and family morals, the Commission found that restrictive measures alone had not created housing conditions which are adequate to the maintenance of decent family life. The report shows that no substantial improvement had come in the past 25 years from the demolition of old unsanitary dwellings which had been condemned as unfit for human habitation in 1901, when the present tenement house law was enacted. It showed that of 23 buildings in New York City reported as a public menace in 1885, 14 are still occupied wholly or partially for residential purposes, and that at the prevailing rate of demolition it would be 138 years before the last of the unsanitary "old law" houses were demolished.

Turning to commercial enterprise for an explanation of the status of housing, the Commission found that of the vast new tenement house construction in New York City during the year 1924, only 2.64 per cent of the apartments were offered for rent at less than $12.50 per room per month, the maximum which the wage-earning family can pay. More than two-thirds of the families in New York City have annual incomes of less than $2,500 a year. Approximately one-quarter of the families have incomes between $2,500 and $5,000. Less than one-tenth of the families have incomes of more than $5,000. The wage-earning population is almost entirely included within the class earning less than $2,500 a year. These families can pay not more than $600 a year for rent, and their average rental limit is less than $500 a year. At that rate almost none of the new construction was available to these families. Commercial enterprise in New York City operates successfully for only 30 per cent of the population. For the remaining 70 per cent of the population it does not function directly at all. On this phase of the subject the report said:

> "When private building for profit satisfies the immediate housing demand of 30 per cent of the population, further construction becomes unprofitable. Construction usually continues as long as the market is 'favorable,' or until evidence of surplus is discovered in a downward trend in the higher rentals. Then the lending agencies become conservative and private building stops. The cycle revolves slowly. Even this limited surplus is infrequent. And this small and occasional surplus derived from housing construction intended to satisfy the demand of only 30 per cent of the population represents all that commercial enterprise ever provides to meet the constantly increas-

ing needs of 70 per cent of the population. At all times and in all places, private enterprise has been unable to supply adequate housing to meet the needs of the underlying population.

"The average family must be content with the left-overs—and there are never enough of these to permit adequate housing for more than half the population.

"A system of producing houses which is geared to satisfy less than one-third of the current requirement of society must be accounted a social failure. It may function satisfactorily in its limited field, but it must be supplemented by some other producing agency if the social need for housing is ever to be satisfied.

"Public interest in housing has gone through two stages: first, the recognition of the housing problem, investigation, and agitation; second, an attempt to combat the evils of bad housing through restrictive measures, the establishment of minimum standards of quality and space in housing necessary under urban conditions for health, safety, and public welfare. Public interest now faces a third stage, namely, to make the standards established by the state effective by measures which will supply a sufficient quantity of standard housing at rates which two-thirds of the population can afford."

The legislation recently enacted is intended to meet this challenge. The state of New York has given a pledge that her citizens shall be decently housed, has acknowledged the public necessity of adequate homes for workers, and is now committed to a policy of slum clearance.

For Greater Safety on the Highways

By B. H. Piepmeier

Chief Engineer, Missouri State Highway Commission

THE following suggestions to motorists have been issued by the Missouri State Highway Commission as an aid to safety upon the public highways:

1. Keep car under control at all times and be prepared to stop within one-half of the sight distance ahead.
2. Keep brakes in good repair.
3. Do not drive from a side road or private driveway into a boulevard or arterial highway, such as a state road, without stopping and looking both ways.
4. Do not race on the highway; the unexpected is likely to happen.
5. Do not be a road hog; stay on your side at all times.
6. When turning corners or driving around sharp curves, keep to the right side of the highway and use the horn freely.
7. Keep to the right side of the road when driving and do not pass vehicles going in the same direction on curves or on the summit of hills.
8. See that your headlights are focused upon the road ahead and not up in the air. Do not use excessively bright lights. Keep both headlights burning at night. Insist upon horse-drawn vehicles' carrying lights.
9. Always signal the driver ahead when you want to pass from the rear, and then be sure that you pass on the left side.
10. Frequently examine the tail-light, and see that it is operating.
11. Keep your eyes on the pavement or traveled way ahead of you and avoid driving off the surface.
12. Always be on the lookout for loose gravel, mud, etc., when making an abrupt turn.
13. Always walk on the left side of the pavement or traveled way. Instruct others to do this.
14. Avoid a sudden stop, and do not park on the pavement or traveled way.
15. When turning corners, stopping, etc., give proper signals with hand in sufficient time so that approaching traffic may have warning in due time to avoid accidents.
16. Make repairs on side roads, or entirely clear of the pavement or the traveled way.
17. Carry a pair of good wheel chains for emergency use.
18. Drive carefully when the pavement or roadway is wet or slippery. Spots covered with mud, snow, or ice may cause you trouble.
19. The increased mileage of improved roads increases the amount of travel and the speed of traffic, therefore be careful at all times; it is better to be safe than sorry.
20. Observe all warning signs. The orange or yellow diamond signs indicate possible danger upon the highway and warn the travelers to reduce their speed. The orange or yellow hexagonal signs indicate "Stop," and should be observed for safety. The orange or yellow square signs are primarily for information, and the traveler should always observe these signs; they do not, however, mean that the traveler must reduce speed, but that he should be on the lookout for a possible hazard independent of the road, such as a school, side road, etc.
21. The road engineer and builder are striving to help make all roads safer by relocating many sections, building longer curves, and superelevating them, by building wider bridges, heavy guard-fences, subways and viaducts under and over railroad crossings, marking center strips on pavements, erecting warning signs, etc. The engineer and the builder must, however, have the cooperation of the traveler to insure safety to life and prevent destruction to property. The careless and reckless driver is a menace to traffic and the cause for stringent rules that are frequently unnecessary and impose hardships upon others. Every driver should be careful and courteous upon the highway for the good of all concerned.

The Need for the Inspection of Cast Iron Pipe

By Fred M. Randlett

Pacific Coast Manager, Robert W. Hunt Company, Engineers, Chicago, and formerly Water-Works Engineer for Portland, Oregon

CAST iron pipe, whether used for the transportation of water, gas, or oil, should be made of such material and in such a manner as will make it safe and reliable.

To the engineer or manager of any utility plant or corporation having to do with constant service to the consumers, it is a self-evident fact that breaks, failures, and interruptions of service are not only expensive but, in the majority of instances, dangerous to life and health, causing annual damage and loss of business hard to calculate in dollars and cents. It is therefore the duty and desire of every honest official or owner to make every reasonable effort to procure the best materials and perform the work of construction in the most approved manner, thus assuring against trouble and expense otherwise quite usual.

Good Insurance

Competent inspection insures uniform pipe from any one foundry and is welcomed by all foundries whose aims are to produce only the very highest grade product. Inspection of all processes and the final product before dipping and shipping will minimize the danger of breaks and consequent failure of a water-supply.

First comes the design of the system, in which the sizes and quantities are determined.

Second, specifications must be drawn to describe fully the materials to be used in the manufacture of the pipe and appurtenances, stipulating the allowable deviation of the various elements in the composition, detailing whether or not annealing is required, and to what extent, stipulating the tolerances as to dimensions and weights, and prescribing the tests, both physical and chemical, that must be passed to make acceptable material.

Third, regardless of where or under what conditions the materials are purchased, or what the contractor may furnish, it is essential to arrange for competent, honest, and efficient inspection and supervision during the process of manufacturing and testing. Furthermore, to avoid delays and disputes, this inspection or supervision must take place, if possible, at the time the material is being manufactured, and not at the point of destination or after it has been dipped or painted or allowed to accumulate rust and dirt.

The inspection of cast iron pipe and specials should be done by disinterested persons having no connection, financial or otherwise, in the contract or plant, and preferably not interested in the purchase price from the buyer's standpoint. The inspectors should have had long and continuous experience as inspectors of cast iron pipe and fittings. If such inspectors are employed, they will check over the mill or foundry orders and specifications, seeing that they agree with those furnished them by the purchaser. They will witness the charging of the furnace or cupola, see the molds prepared, and that cores, when used, are properly made and placed; see that the iron is at the proper heat when poured, and the pipe properly cooled before being removed from the molds, and that nothing is done to set up internal stresses from uneven cooling or other avoidable processes.

In the case where annealing is specified, they will see that the temperature is right and that each and every piece is held at the proper temperature for the specified time, or to obtain the results specified. After being removed from the molds and cleaned, each and every piece should be examined for defects and checked for dimensions, the hydraulic testing, coating and weighing should be witnessed, and finally the tallying of the loading for shipment, if directed by the purchaser.

The foregoing procedure has been found necessary, not because any reputable foundry or plant intends to furnish a product that deviates from that specified in the contract, but because no human effort is infallible and no plant 100 per cent efficient at all times, and by efficient inspection such errors and

faulty materials are at a minimum and consequently the liability of damage and dispute eliminated as far as possible.

Some purchasers choose to perform inspection work more or less as outlined above, by using employees in their own organization, but after some years of experience and from information gained from observation, it has been proved that the best results are obtained by having an organization with employees, engineers, and chemists trained and skilled each in his particular line and having no interests other than those similar to the professional interests of the engineer, doctor, and lawyer to their respective clients.

Another feature, almost if not quite equal in importance, is the fact that an organization enjoying a sufficient volume of business is able to keep inspectors on the job who are familiar with the particular practices employed by the plants with which they are acquainted, and are therefore able to detect any deviation from the regular routine, which might pass unnoticed by an inspector who is only at the plant occasionally or who never has seen that particular plant in operation. The receipt of inspection certificates, previous to arrival of shipments, enables the purchaser to know the number of lengths with the serial number of each accepted piece and of each rejected piece, as well as the causes for rejection, and shows the general history and progress of the order from its origin.

The engineer is interested because it assures him that his instructions and plans are being followed. The manager is interested because he must avoid disastrous mishaps and interruptions that are costly and that consequently draw on funds for repairs and damage that might have been avoided.

The owners, whether as individuals represented as stockholders, or in the case of municipal ownership as customers, should be particularly interested in efficient inspection of all materials going into the plant, because the elimination of faulty material directly affects the earnings of the plant and the cost of service.

Trafficking in Humor

The Test

"Jim is a tremendously convincing talker, don't you think so?"

"I did, until I heard him try to talk back to a traffic officer."

—*Boston Transcript.*

Tail-Lights for Pedestrians

And now jay-walkers are to be arrested. It's only a question of time until pedestrians will be compelled to carry klaxons and wear tail-lights.—*Frederick Landis.*

Those Signs

A road sign reads: "Drive slow, you might be a fool." A better sign, in some instances, would be: "Drive slowly; two fools might meet."—*Florida Times-Union.*

Sign in subway reads: "Take this train to the Zoo." But why go to the zoo when you can stay in the subway?—*New York American.*

Why He Did

"Why do you turn out for every road hog that comes along?" said the missus, rather crossly. "The right of way is ours, isn't it?"

"Oh, undoubtedly!" answered he calmly. "As for turning out, the reason is plainly suggested in this epitaph which appeared in a newspaper recently:

"Here lies the body of William Jay,
Who died maintaining his right of way;
He was right, dead right, as he sped along,
But he's just as dead as if he'd been wrong."

—*Boston Transcript.*

The Down-Town Parking of Automobiles

BUSINESS MAN (talking to patron): "What can I do to increase the efficiency of my service?"

PATRON: "Bring your automobile and park it in front of your place of business and ask your employees to do the same, so that the patrons, who wish to patronize your store will have to walk four or five blocks to do it."—*Boone Chamber of Commerce News Bulletin.*

Safety Last

Lies slumbering here one William Lake; he heard the bell, but had no brake.—*Detroit News.*

At 50 miles drove Allie Pidd; he thought he wouldn't skid but did.—*Rome Times.*

At 90 miles drove Eddie Shawn; the motor stopt, but "Ed" kept on.—*Little Falls Times.*

Here he sleeps, one Johnny Fonker; he rounded a turn without a honker.—*Scranton Scrantonian.*

Down in the creek sleeps Jerry Bass; the bridge was narrow; he tried to pass.—*Wilkes-Barre Times-Leader.*

Beneath this stone sleeps William Raines; ice on the hill; he had no chains.—*Harrisburg Telegraph.*

And here's what's left of Samuel Small, he paid no attention to "slow" signs a-tall.—*Capper's Weekly.*

Here lies all that's left of Harry; at the railroad crossing he did not tarry.—*Railway Life.*

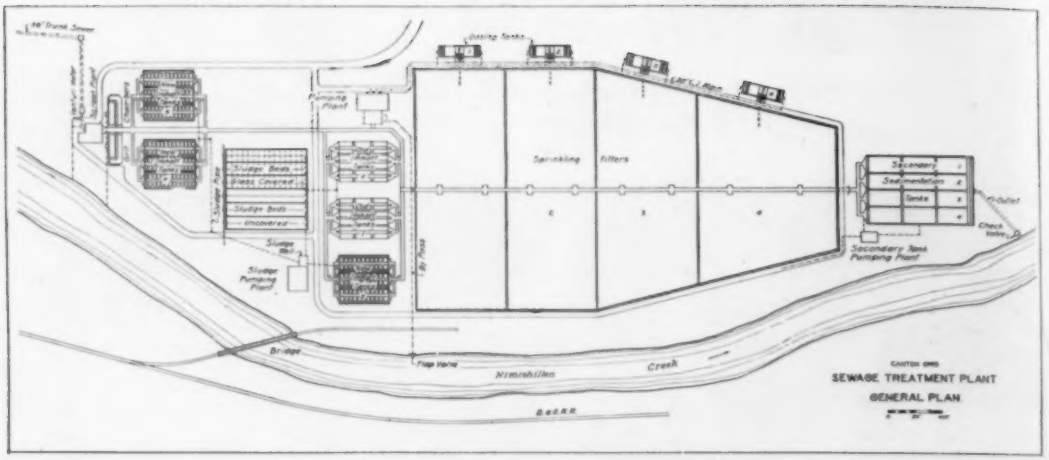
John William Jones lies under this thistle; he didn't heed the choo-choo's whistle.—*Railroad Data (New York).*

A Providential Threat

If the Water Department Had Installed Meters, George Would Have Been More Careful and Not Turned His Cellar Into a Swimming Pool

Courtesy of Judge

"OH, GEORGE! THE COLLECTOR IS HERE FOR THE WATER DEPARTMENT AND HE SAYS IF YOU DON'T PAY LAST YEAR'S BILL THE WATER WILL BE SHUT OFF AT ONCE"



New Sewage Treatment Plant at Canton, Ohio

By George A. Reese

McClaskey & Reese, Consulting Engineers, Canton, Ohio

THE city of Canton was one of the pioneer municipalities in the state of Ohio in the practice of the treatment of sanitary sewage. The first plant, which was constructed in 1893, was a "chemical precipitation" plant using lime as a precipitant. It is understood that this was the first chemical precipitation plant west of the Allegheny Mountains, and it is also understood that it was the largest in the United States at that time, attracting visitors from various parts of this country as well as Europe. No data were available regarding the designed capacity of this plant. The plant was located at the southerly edge of the city, and its effluent discharged into Nimishillen Creek nearby, while the sludge was pumped over the adjacent farm land to utilize its fertilizer value.

With an increasing population, however, this plant became inadequate to properly treat the increasing sewage flow, resulting in considerable litigation. The site was becoming less appropriate for sewage treatment purposes, and its size precluded adequate extensions at this location. With the advent of other and apparently more satisfactory methods of treatment, it was concluded to abandon this plant and site and construct another one at a new location.

In constructing the second plant, it was

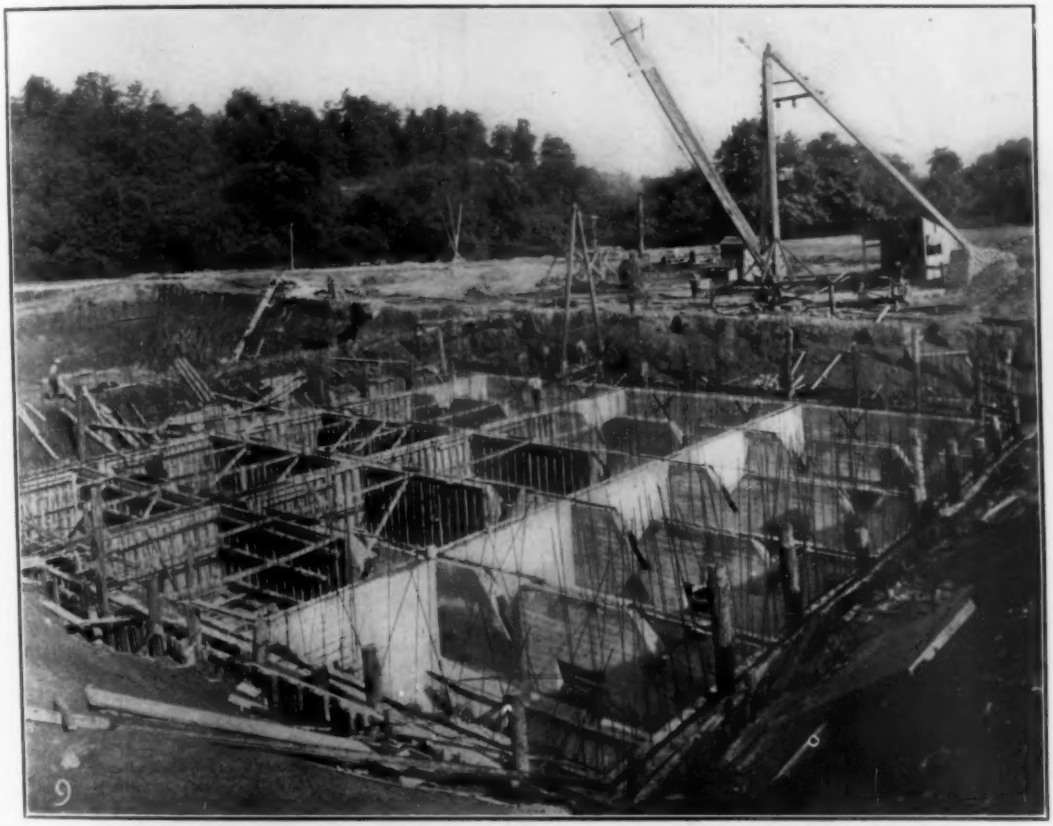
SPRINKLING-FILTER UNIT UNDER CONSTRUCTION

Distribution main in two units and part of the floor sys tem may be seen. The conveyor system for placing filtering materials is shown in the middle background, and the dosing tank in the left foreground

decided to choose a site sufficiently remote from the city to assure freedom from any odor nuisance and also at a location which would not be included in future city development for a long period of time. The past city expansion had not gone in a southerly direction, the presence of the sewage treatment plant and a garbage incinerator having been in a measure derogatory to such development, especially in the vicinity of these works. Hence, isolation was considered essential. Furthermore, by locating further down the Nimishillen Creek valley, sufficient fall would be realized to provide the existing municipal area and considerable future expansion with a gravity sewerage system, thus obviating any expense of pumping.

A site was finally chosen about eight miles south of the public square. This necessitated the construction of a new trunk sewer, which was built mostly of segment block, being 39 inches in diameter and having a capacity of 18 million gallons per day. Canton is provided with separate sewer systems, the storm water being discharged into the East and West Branches of Nimishillen Creek, which flow through the city, and the sanitary sewage being conducted to the treatment plant.

The second plant, which was begun in 1913, was one of the early Imhoff tank plants in this country. It consisted of screen and grit chambers (manually cleaned); two batteries of rectangular Imhoff tanks, each having three tank units; contact bed filters of sixteen units; and sludge drying beds of six units, three of them housed in greenhouse construction. Several years after its completion the screen and grit chambers were housed in a brick building which also contained a subsequently constructed incinerator to dispose of the screenings.



CONSTRUCTION VIEW OF IMHOFF TANK NO. 5 OF THE CANTON, OHIO, SEWAGE TREATMENT WORKS
Excavation for tank No. 4 is shown at the left of the picture

The sedimentation tanks were of the early type with contracted sludge chambers. Before their capacity was exceeded, the operation of these tanks was quite satisfactory, effecting an average removal of 74 per cent. The sludge was removed by gravity, was of excellent quality, and dewatered rapidly. Foaming was experienced at times, but was controlled by hosing.

The contact beds covered an area of seven acres. There were sixteen units fed by a central flume, the inflow being controlled by hand, while the period of contact and discharge were accomplished by means of 14-inch timed siphons, one in each bed. The siphons discharged into a main collecting gallery under the central distributing flume, and the effluent was discharged into Nimishillen Creek. The walls and floors were concrete. Filtering material consisted of a shallow layer of coarse gravel 2 to 3 inches in size, and the remainder crushed and screened blast furnace slag ½ to 1½ inches in size, having a total average depth of 5.5 feet. Underdrains were inverted half tile with side openings. This slag produced a very efficient and satisfactory filtering media. The later reconstruction of these filter beds necessitated the removal of the slag, an operation which gave an excellent opportunity for inspecting this material after ten years of service. There was no indication of cementation or breaking down of this material nor disintegration due to frost or other action. In the light of this experience and that at other locations, the suggestion is advanced that care should be exercised in placing slag so that the very fine particles be eliminated as much as possible and that the concentration of "fines" be avoided.

The sludge drying beds had outside and dividing walls of concrete and rolled earth floors. Filtering material consisted of several layers of graded sand and fine gravel. The drains consisted of 4-inch laterals and 6-inch mains which discharged into a 6-inch trunk emptying into the creek. The greenhouse construction over three of the units was partially satisfactory. Precipitation was restrained from falling upon the drying sludge while the glass was intact, but hail-storms were often destructive and defeated the purpose of this covering. It was soon indicated that sufficient sludge drying area had not been provided, and a steam pump and boiler were installed to pump the sludge to neighboring farm lands for ultimate disposal, in addition to the drying bed facilities. The dried product from the beds has been constantly in demand for fertilizer purposes and hauled by farmers living as far as 25 miles from the plant. No charge was made for the sludge.

New Plant

With the continued increase in population, the capacity of all portions of the second plant were exceeded, necessitating further expansion of the plant. Furthermore, with the consummation of a system of intercepting sewers which will make the population 100 per cent contributory, an additional load will be realized, also demanding more plant capacity. These demands are being met by the construction of extensions and additions to the second

IMHOFF TANK NO. 5 OF THE CANTON, OHIO, PLANT PRACTICALLY COMPLETED EXCEPT FOR THE CONNECTING CHANNEL AT EACH END

CLOSE-UP OF CANTON, OHIO, SEWAGE FILTER UNIT, SHOWING FILTER FLOOR AND DISTRIBUTING MAIN

Method of placing filtering material with belt conveyor system is shown, material coming from cars at left

plant and certain reconstruction, which in reality will comprise practically a new plant. The 1920 census gives the population of Canton as 87,091, while the present population is estimated to be about 105,000.

The new plant now under construction will include a new screen plant; grit chambers; three batteries of rectangular Imhoff tanks in addition to the two existing ones; pumping-plant to elevate the tank effluent to four dosing tanks; four units of sprinkling filters; and four units of secondary sedimentation tanks.

The layout of the new plant was planned with the view of developing the entire area available at this site without excessive excavation or considerable pumping. Consequently, it was decided to locate the screen plant in the extreme upper part of the site, which will provide space for two sets of the new primary tanks now under construction and also for two additional sets for future expansion, the latter to be located in the space now occupied by the sludge drying beds, which may be abandoned some time in the future.

Screen Plant

The screen plant consists of two parallel flow compartments, each 6 feet by 27 feet in plan and 5 feet total depth. Each compartment is provided with two bar screens 6 feet apart, the first set having 2½-inch openings, and the second having 1-inch openings. The screens will be used to exclude objects which might be destructive to pumps, and materials which may not readily be reduced in the sedimentation tanks. Comparatively large amounts of rags and considerable rubbish have been carried to the old plant. The screens will be cleaned by hand. The screenings will be burned in an adjacent incinerator. The incinerator is provided with a ventilated hopper having a capacity of 24 hours of screenings, which may be consumed at one firing of the furnace if desired. The incinerator is of the "down draft" type of furnace. The entire screen plant will be housed in a brick building with substructure and channels of concrete. Immediately preceding the screen plant and at the new terminus of the trunk sewer will be placed a special 36-inch sewage venturi meter tube to measure the sewage flow, the recording instruments being located in the screen plant building.

Grit Chambers

The grit chambers will be placed immediately below the screen plant. There will be two units each 10 feet 6 inches in plan with an average total depth of 7 feet. On account of the topography these units will extend on both sides of the plant axis at right angles instead of being built in the usual longitudinal manner. The sewage will flow away from the main channel through one of the grit chambers and return in channel to the main channel farther down its course. Either chamber unit may be used while the other one is being cleaned. An overhead tramrail system will be constructed over the grit chambers, and an electric hoist and clamshell bucket operated from a cab will be installed for the purpose of cleaning the chambers. As these chambers are in a straight line, no curves or switches are required on the tramrail and an

easy, rapid and economical cleaning operation will be obtained. The tramrail system will extend beyond one chamber a sufficient distance to easily dump the bucket into wagons. The interior face of the side walls of the chamber has been designed so that little manual labor will be required for cleaning.

Channels

From the grit chambers, the sewage will be conducted to the Imhoff tanks by means of a system of reinforced concrete channels. The greater portion of these channels will be of the two-story type. Careful construction will be necessary on these channels to maintain the designed grade, as the available loss of head is at a premium. The cross-sections of these channels vary with the quantity of sewage to be carried, varying from 5 feet 6 inches to 8 feet in width.

Primary Sedimentation Tanks, and Pumping-Plant

Two of the three new sets of sedimentation tanks are located immediately below the grit chambers, and the third new unit is located west of the two existing units. These tanks have vertical outside and interior main walls, in comparison with early designs having walls contracting at the sludge chambers, which resulted in serious decrease of sludge capacity per unit of surface area. Each unit is composed of three independent tanks connected at each end by the supplying channels. Each tank of the unit has five sludge compartments.

The upper story of the channels carries the sewage influent to the tanks, and the lower story removes the effluent from the tanks. With this scheme of channels, a maximum flexibility of tank operation is obtainable. The tanks of each unit may be operated in parallel with the flow introduced at either end, or may be run in series and completely reversed when entered from either end.

The tanks are designed with a detention period of three hours with maximum flow. The sludge chambers are designed for a capacity of 2 cubic feet per capita. The outside dimensions of each unit in plan are 90 feet by 94 feet with a maximum depth of 27 feet and a freeboard of 1.5 feet. The sludge chambers have hopper-shaped bottoms. Sludge is removed by superimposed water pressure and cast iron piping with a riser pipe and plug valve at each chamber. Water piping is installed to loosen the sludge if found necessary. The tank units are constructed of reinforced concrete.

As the available natural loss of head through the plant is far too small to operate sprinkling filters, it will be necessary to pump the sedimentation tank effluent to the dosing tanks. The lower story of the channels conducts the tank effluent to a concrete suction well adjacent to the pumping-plant. The pump building will be of brick, 28 feet by 55 feet in plan, with concrete substructure. Three pumps will be installed, with space and connections for a fourth unit. Two pumps will be in constant operation, while the third is held in reserve. The pumping units are horizontal, motor-driven centrifugal pumps of 4,700 gallons per minute capacity. Motors are squirrel-cage, 3-phase, 60-cycle, 2,300-volt, with a speed of 865 r. p. m. Operation will be automatic by means of float switches and automatic starters. The discharge main is a 30-inch cast iron pipe, conducting the clarified sewage to the dosing tanks. The total pumping head is about 35 feet.

Dosing Tanks

There are four sets of twin dosing tanks, each set serving one sprinkling filter unit. A high terrace bounds the filter units on their east side, into which the dosing tanks are recessed. Each unit is 76 feet by 18 feet in plan with a maximum water depth of 9 feet and a freeboard of 1.5 feet. Each tank of the twin set has a capacity of 18,500 gallons. A sloping floor is provided to vary the head and quantity of discharge to produce effective distribution over the filters. Each tank of a set is supplied with two 6-inch by 72-inch automatic air-locked cast iron feeds and a 30-inch trapless siphon. Both siphons of the set discharge alternately into a common discharge chamber, the outlet pipes being furnished with balanced flap valves to guard against back pressure. Each tank of a set will fill and discharge alternately with the other. The tanks are built of reinforced concrete.

Sprinkling Filters

As previously stated, secondary treatment with the old plant was accomplished in contact beds of which there were sixteen units. With the new plant these contact beds are converted into sprinkling filter units. The outside walls and the alternate interior dividing walls are raised about 2 feet, which will produce four sprinkling-filter units and will provide an average depth of 7.5 feet of filtering material. Each unit will have an effective area of 1.7 acres.

The distribution system in each unit consists of a cast iron main, 30 inches and 24 inches in diameter, and 6-inch cast iron pipe

laterals, there being about 4 miles of the latter. The main is set on small concrete piers and is connected to the laterals by "bull-head" tees. The top of the lateral pipes will be at the surface of the filtering material, and the spray nozzles will be screwed directly into the laterals. The spray nozzles are round, with 7/8-inch orifices, and are spaced on nominal 15-foot centers.

The main central collecting gallery and main drains of the original contact beds are utilized in the drainage system of the sprinkling filter units. New lateral drains are constructed in the units which slope toward the main drains. Upon the existing concrete floor, small parallel concrete ridges are built, the space between the ridges constituting drainage troughs. Upon the ridges, special flat vitrified clay blocks are laid in mortar, the blocks being placed on edge. These blocks support the filtering material. This construction has produced an excellent filter floor.

Filtering material consists of crushed and screened blast furnace slag, about 80,000 cubic yards being required. The first and bottom layer, about a foot in depth, is of 3-inch to 4-inch size and the remainder 1½ inches to 2¾ inches in size. Ventilators are provided at the ends of the main drains, and means are provided to flood the units as desired, to destroy the larvae of flies or other insects should they abound in the filters.

Secondary Sedimentation Tanks

From the sprinkling filter units, the sewage will pass to the secondary sedimentation tanks. There are four of these units, each 30 feet by 150 feet, in plan with an average depth of about 10 feet. Capacity is provided for a detention of 1½ hours. These tanks are intended primarily for the unloading period of the sprinkling filters. The sewage will discharge from these tanks into the creek. Sludge will be removed by pumping and may be discharged either into the sludge chambers of the primary sedimentation tanks or in the sludge suction well, to be disposed of with the sludge coming from the primary tanks.

Sludge Disposal

This plant is very favorably situated in the matter of sludge disposal. No new sludge drying beds will be constructed in extension to the existing ones, which are comparatively little used. The sludge from the sedimentation tanks will be conducted to a sludge suction well, from which it will be pumped to adjoining farm lands. The city owns about 400 acres, the greater part of which may be used for disposing of the sludge in conjunction with cultivation, and numerous farmers in the vicinity are continuous recipients of the sludge pumped upon their lands. The city pumps the sludge to a given farm, and the farmer provides the means and labor to distribute the sludge over the land. The city makes no charge for this service. At times the sludge is pumped as far as two miles from the plant. As the lands upon which the sludge is pumped are somewhat isolated, no cause for complaint has arisen. At a very low estimate, this method of sludge disposal may be practiced for forty to fifty years. A duplex, ball valve steam pump is used for the purpose. This method of sludge disposal has proved very economical, and as an additional feature, the city has opened a small coal mine upon its land from which fuel is obtained for steam purposes.

Miscellaneous

A water system is provided for cleaning and flushing purposes. In this system is included a concrete reservoir with a capacity of 50,000 gallons, located on a hill about 100 feet above the plant.

To prevent deterioration, quite common to concrete around sewage treatment plants, due to frost action, the exposed concrete at this plant has been frostproofed.

The plant is designed for a population of 150,000. It is expected that construction will be completed and the plant put into operation early this summer.

The Homes Construction Company of Wooster, Ohio, is the general contractor, with A. Stellhorn in direct charge, and McClaskey & Reese of Canton, Ohio, are the consulting engineers, with R. E. Boyce as resident engineer.

The Worst Possible Slogan

when conditions need correction in your town, is

"HUSH"

House Refuse Collection in Gosport, England

By E. J. Goodacre
Borough Engineer and Surveyor

COLLECTION equipment for house refuse in Gosport, England, consists of three two-wheel trailers provided with a hitch-bar and movable steel shafts. The trailers are covered and have a capacity of 2 tons the wheels being fitted with ball bearings. There is also one Fordson tractor with rubber tires and one Ford one-ton covered truck. For collection purposes the town is divided into districts and worked by two gangs. Gang No. 1 begins work at 7:30 A. M. with a horse and trailer. Gang No. 2 begins at 8 A. M. with another horse and a trailer. The Fordson tractor meets Gang No. 1 about 9:30 A. M., leaving an empty trailer and conveying the full trailer to the destructor, which, after dumping, proceeds empty to the No. 2 gang and so on.

TWO-WHEEL HORSE-DRAWN REFUSE WAGON DURING COLLECTION

The scheme originated with the author in 1921. The advantages are that horses are used for the actual collection where constant stopping and starting is necessary, the tractor with the driver alone conveying the full and empty trailers to and from the destructor, and the laborers loading the trailers are employed continuously. The Ford one-ton truck is used for outlying districts, barracks, and government establishments.

The actual cost of collection for the three months ending June 30, 1924, was £609, for which 1,708 English tons (of 2,240 pounds) of refuse was collected at a cost of 7s. 8d. per ton. These figures are from two collections per week, but the costs are decreasing as the scheme becomes more efficient.

The Council recently decided to collect daily from the town district, so that another Ford truck has been purchased for that purpose. It is the author's belief that this will mean a probable saving of £700 per year. Despite the fact that additional collections have now been ordered, it is not expected that the original estimate will be exceeded by any great amount.

Collection is greatly hampered by the fact that only 20 per cent of the houses are provided with proper refuse containers, the remainder having all sorts of open receptacles from old enamel basins to wooden tubs. It is expected that this difficulty will be overcome shortly by a new law requiring uniform containers.

TRACTOR DRAWING LOADED TRAILER TO DISPOSAL PLANT

New Water-Supply Made Possible by Chamber of Commerce

Organization Promotes Publicity and Helps Finance New Municipal Works

By C. W. Murphy

Managing Secretary, Chamber of Commerce, Bloomington, Ind.

THE new water-works of Bloomington, Ind., which are nearing completion are a cause for pride on the part of its citizens, especially the one hundred and fifty who together pledged $780,000 to overcome litigation which was delaying construction. With a population of 16,000 people needing water for domestic purposes, with the state university and many industries, including a dozen stone mills which use great quantities of water in their operations, Bloomington was, in 1922, and had been for some time, depending on three dams impounding a maximum of about 250,000,000 gallons, which had to be conveyed 6 miles through a 12-inch main to supply the daily consumption of 1,500,000 gallons. Numerous water famines had created losses and physical and mental distress at frequent intervals during the preceding 25 years.

The term "famine" did not mean necessity for economical use of water, but that for weeks during dry periods the city mains could be filled only two or three times a week, and when such fillings were possible the citizens and industries left their faucets open and filled all available receptacles for a storage supply to tide them over until seepage could create a sufficient depth of water to start the pumps again. But for Indiana University's generosity in supplying all homes in which students were housed, there would have been greater distress. Stone mills, furniture and mirror-plate plants, and the railroads were compelled to haul water in tank-cars to supply their needs even under curtailed operations.

BEGINNING THE GRIFFY CREEK DAM FOR BLOOMINGTON'S WATER-SUPPLY

This photograph shows the work on the solid steel wall composed of sheet steel piling about 20 feet deep and resting on impervious knobstone. This wall extends entirely across the valley and under the center of the dam

Without water in the mains and only four of the ten down-town fire cisterns containing water, the city would have been at the mercy of fire had a blaze started. Fortunately, no conflagration occurred.

Efforts of various groups of citizens to effect a decision which would permit following

the advice of competent and experienced engineering firms had failed repeatedly, until conditions had aroused the more determined citizens. The first real step towards solving the question was the reorganization of the Chamber of Commerce, which was followed by a full discussion of the needs and how to meet them. Determination to prevent further expenditure of public money in trying to impound and hold water in a geological formation which had proved leaky, was publicly announced in the following resolution, adopted June 8, 1922:

Whereas, the Board of Directors of the Chamber of Commerce of Bloomington, Ind., in regular session, June 8, 1922, having discussed the subject of an adequate water-supply for Bloomington, is unalterably opposed to further temporizing on a question of such vital importance to the welfare of the city, and

Whereas, the present proposal of the Mayor and Common Council will be in our belief a waste of public money, be it

Resolved, that we, the Directors of the Chamber of Commerce, hereby protest against the waste of public funds and insist on action being started to provide a permanent water-supply for Bloomington, as recommended by competent engineers after careful surveys and investigations as to the needs of the city now and for the years to come; these recommendations being to depend only on a supply drawn from White River or from damming and impounding a supply in the Griffy Creek Valley. We further oppose the further expenditure of money at the Leonard Springs site. Bloomington has already constructed five dams in the vicinity of the present plant, contrary to the advice of competent engineers, and none of the lakes created have proved reliable.

Coming at a time when the voters were divided on the subject and with the Common Council on record as authorizing a $100,000 bond issue to build another dam in the old formation, the Chamber of Commerce opened its publicity with this statement accompanying the resolution:

"Directors of the Chamber of Commerce have taken a step which no organization engaged in community development would dare take without positive knowledge that conditions justify facing an important task fearlessly, and that results will eventually convince uninformed critics who may at first oppose the decision. To brand as useless and unnecessary and wasteful in its ultimate results a vote of the Common Council is a bold act, which nothing less than the highest ideals and the most earnest desire to perform a community service would warrant.

"The decision of the Chamber of Commerce Directors is to resist by any legal means necessary the issue and sale of $100,000 worth of bonds for further experimenting at Leonard Springs.

"This decision is forced by knowledge that the sum mentioned will be only a small part of what will be required to follow it and that no sum of money will ever be sufficient to provide a sufficient supply at the Leonard Springs plant.

"That there will be criticism of this action, there is no doubt, but the organization officers are confident of the necessity for dealing frankly and firmly with the problem, the solution of which is the key to the future success and prosperity of Bloomington. They know that temporizing and indifference will result in a further series of unreliable makeshifts and that only by facing the real issue squarely and fighting fairly will the problem ever be solved. By adoption of the resolution they have gone on record as being determined to give Bloomington an adequate supply."

With this announcement the fight for water was on, and petitions and counter-petitions and protests became weapons of offense and defense with the courts, the State Tax Board

LOOKING WEST FROM THE SPILLWAY, SHOWING CONCRETE ON UPPER FACE OF EARTH DAM

and Public Service Commission as referees of the numerous trials and hearings to decide the legality of procedure.

The Beginning of a New Water-Supply System

Bloomington owned its water-supply system, against which there was an an indebtedness of about $26,000. To provide the new plant, the Bloomington Water Company was formed by citizens chosen by the Chamber of Commerce. Officers were elected and a $150,000 corporation was authorized, with permission to issue $125,000 common stock and $250,000 preferred stock. The Common Council, which had changed its vote from a majority against to a majority for the new project, voted a bond issue of $125,000 to purchase the common stock and thus control the new company. Bonds were sold and the stock purchased, notwithstanding the resort to injunction proceedings by opponents of the plan, but litigation created uneasiness on the part of bond buyers, and the construction contracts were ready for letting, with no money available from city securities which had been authorized.

COMPLETED SPILLWAY OF NEW BLOOMINGTON, IND., WATER-SUPPLY

The spillway is built on solid stone, blasting having been necessary to make room for the masonry work

Delay was prevented by calling a meeting for the purpose of financing the work, with the result that a total of $780,000 was pledged to guarantee payment for a $375,000 job. With these pledges as surety, the First National, the Citizens and the Monroe County banks advanced the cash on construction estimates, only one call being made for payment on pledges, a 25 per cent assessment.

The new lake is in knobstone formation, the dam, 1,000 feet long and 22 feet high, being thrown across Griffy Creek valley three miles north of town. The present capacity of this lake is 490,000,000 gallons, almost a year's supply if there should be no rainfall. The drainage area is 8 square miles, which during a normal year's precipitation will receive over 50,000,000,000 gallons of water, but it is the storage advantage which makes the new site attractive and valuable. At this site the dam may be increased to 100 feet in height before the porous stone in the valley walls is reached.

Contrary to the prediction of many that the earth dam would be washed away at flood time, that the bottom would fall out of the lake under the weight of the water, that the knobstone was porous, and that various other forms of danger would cause the money to be wasted, the dam is still holding water.

Before the new work was completed the old lakes failed, the pumps were shut down, and the city mains were empty. Then the worth of the new lake was demonstrated. Though there had been no rainfall to fill it, underground water had been forced up by the sheet steel piling driven 20 feet to bedrock, and before the water was deep enough to reach the lowest opening in the intake crib, a supplementary pump was set to reach the water, and the city was supplied.

Instead of attempting to supply the million-and-a-half gallons daily demand through a 12-inch main 6 miles long, the new plant has an 18-inch main 3 miles long for delivering to the city mains. Bloomington has always been dependent on surface water, and this condition will no doubt continue, as attempts to find underground streams have failed.

Since the completion of the dam the higher court rulings made delivery of city bonds possible, and the Common Council has recently voted to take the remaining $25,000 common stock, which will permit the construction of a filtration plant near the dam and a stabilization basin between the lake and the city at an elevation to provide gravity pressure in case of accident at the pump station.

This story as written does not convey more than a hint of the obstacles overcome, nor has

mention been made of the breach of personal friendships or the care required to prevent hatred which could not be corrected, but happily old friends are again on speaking terms, and the city has settled down to enjoy the feeling of security in immunity from the old menace of a water famine.

While this accomplishment must be credited chiefly to the influence of the Chamber of Commerce, the job could not have been completed without the active cooperation of the press, the service clubs, Rotary and Kiwanis, and the various clubs and societies composed of citizens desiring to serve the community, therefore the Chamber of Commerce claims only that it was the agency by which those who realized the need were put to work together to meet it.

Surface Treatment of Various Types of Roads

By John N. Mackall
Chief Engineer, Maryland Highway Department

Macadam Roads

IT is very easy to generalize about the surface treatment or lack of surface treatment of roads, and it is very easy now to specifically state how surface treatment can be successfully done and to state specifications for materials which will give very satisfactory results, but the difficult and really essential thing about surface treatment is to know when it is to be done. I regret that I cannot give a very definite formula for *when* roads are in need of surface treatment, but if I can direct the maintenance engineers' attention to the fact that the most important feature connected with the maintenance of any surface-treated macadam road is *when* and not *how* it is to be surface-treated, I am sure he can determine for himself when roads are in need of this treatment. The nearest safe rule I can give is to put off surface-treatment work as long as it is possible to put it off, and then wait another year before actually applying it. This rule may at times cause considerable patching before another year rolls around, but the probabilities are that the patching will not be more than mildly troublesome and slightly expensive, and additional surface treatment before one is needed will invariably bring about the destruction of the road through the creation of transverse waves which will make the road unsatisfactory, if not impossible of use.

The road ideally maintained under surface treatment is one which has a continuous film of bituminous material, impervious to water, over the entire surface of the road and of no appreciable thickness. One application to a new road will form a mat which will give some wear. A second application the second year will add something to the depth of the mat and something to its uniformity. An application for the third and the fourth year will invariably destroy the road by the building-up of a mat of excessive thickness which will set up transverse waves, for which there is no remedy except to completely remove them. This, in most cases, means completely scarifying and resurfacing the entire section of the road. On the other hand, the allowance of too much time between successive treatments will permit the surface of the road to disintegrate, and it may be destroyed from this cause. It has been my observation, however, that many more roads have been destroyed from too much treatment than from too little.

When to Treat and What to Use

The time for the determination of whether a road requires surface treatment or not is in the late fall or in the early spring. During the winter most roads will appear to need a surface treatment during the next year, a condition which is often corrected in the spring when the bituminous material begins to get back its life. In examining for the need of surface treatment it is necessary to take into consideration the percentage of dry places which appear in the surface. A place here and there which needs surface treatment does not necessarily indicate that the road needs it. I would say as a general thing that unless surface disintegration shows on an area equal to 5 per cent of the total area of the surface, it is not in need of an additional application.

When it has been determined that a macadam road previously treated is in need of surface treatment, tars or asphalts conforming to the following specifications will give very

satisfactory results if applied with reasonable care. For a road which is being treated for the first time, we have found much more satisfactory results are obtained from the use of the tars than of the asphalts, but after the initial application either gives equally satisfactory results.

ASPHALT

Materials:

The materials to be used shall be prepared by fluxing an asphalt cement of 120 to 150 penetration (100 grs., 5 sec., at 25°C.) with naptha. The naptha used when distilled in accordance with the A. S. T. M. method D 86-21 T. shall have an overpoint of not greater than 225°, and the drypoint shall not exceed 450°. The naptha shall show a continuous distillation between these points.

The prepared oil shall conform to the following specifications, shall be homogeneous, free from water, and conform to the following analyses:

	Min.	Max.
Specific gravity at 25°C.	0.93	...
Flash point, open cup, °C.	...	65
Evaporation loss, 20 g. 5 hrs., 212°F. (100°C.) by weight.	22%	...
Evaporation loss, 20 g. 5 hrs., 325°F. (163°C.) by weight.	27%	...
Consistency of residue after evaporation:		
Penetration at 25°C. of residue of 20 grs. 325°F. loss.	...	100
Specific viscosity (Engler), (first 50 cc. at 40°C.).	40	60
Insoluble in 86° naptha.	14%	...
100 pen. asphaltic content (open evaporation at temperature not to exceed 500°F.)	68%	...

COAL GAS TARS

The materials to be used under these specifications shall be homogeneous, contain not more than 2 per cent of water and conform to the following analyses:

	Min.	Max.
Specific gravity at 60°F.	1.15	1.19
Viscosity (Engler), (first 50 cc. at 40°C.)	250"	350"
Insoluble in carbon bisulphide.	6%	12%
Distillation (250 cc.), (Engler Flask):		
Up to 170°C.	...	7%
Up to 235°C.	...	18%
Up to 270°C.	...	35%
Up to 300°C.	...	43%

WATER GAS TARS

	Min.	Max.
Specific gravity at 25°C.	1.10	1.14
Viscosity (first 50 cc. at 40°C.).	250"	350"
Insoluble in carbon bisulphide.	...	4%
Distillation (250 cc.), (Engler Flask):		
Up to 170°C.	...	2%
Up to 235°C.	3%	15%
Up to 270°C.	18%	30%
Up to 300°C.	25%	40%
Melting point residue. (Ring and ball method)	30%	60°C.

Do Not Treat in Hot Weather

The time of the year plays as important a part in the surface treatment of roads as does the material itself or the rate of application. We know that the rate of application is tremendously important, yet what we assume in the rate of application is a uniform amount for each and every square yard. During the hot summer months, it is, of course, possible to spray an equal amount on the road, but it is impossible to keep it there. Though as little as ¼- or even 1/5-gallon to the square yard is used in excessively hot weather, we have found that a considerable amount of this will work toward the edges, leaving too little in the center and too much along the edges, so that all efforts to bring about uniform distribution are destroyed by gravity displacing the material on the surface. For the convenience of the traveling public we determined that all surface treatment work should be completed before the first day of July. In our efforts to please the public, we discovered that we were able at the same time to eliminate one of the greatest causes of dissatisfaction to the engineer himself on the application of surface treatment.

We were able by doing the work in moderately cool weather to have whatever material was placed on the surface remain where it was placed. This is essential to any successful surface treatment. I would say that a rule which should be inflexible is that no roads are to be surface-treated between the first day of July and the first day of October. It is true that occasionally excessively warm spells are encountered in Maryland in June, and this is true of other localities, but it is not often that these will be found, and when they are encountered surface treatment should be discontinued. On an average, all of the weather in the summer months is too warm for successful surface-treatment work. The surface of the road must be sufficiently cool when the material is applied to it to prevent running or creeping on the surface.

Surface-treating material which is sufficiently heavy to remain in place when applied and of the specifications recommended will require heating to enable it to be pumped from a tank car, and in addition, on many days will require that heaters be placed under the distributors. It is essential, therefore, that all pressure distributors be equipped with heating apparatus in addition to having the tank-car equipped with coils for heating purposes.

Applying and Rolling

We will assume a fair day's work to be 5,000 gallons of material applied at the rate of ¼-gallon to the square yard, which will cover a little more than 2 miles of road of a width of 16 feet. The number of men to do the covering, and the length of haul for the truck, will increase or diminish this amount, but we have found this to be a fair day's work for one outfit. Prior to the application of the bituminous material, stone chips of a good, hard quality or clean washed gravel, in either case passing a 1-inch ring, free from

dust, should be provided along the side of the road at the rate of 20 pounds to the square yard. For the convenience of the men in applying the material to the surface, this should be placed in piles not more than 15 feet apart and immediately adjacent to the edge of the road. We have found no mechanical distributors which will handle either stone or gravel in a way to give as satisfactory or as economical results as distribution by hand.

For each pressure distributor there should be supplied not less than three power rollers, preferably gasoline-propelled. We say gasoline-propelled because it has been our experience that one gasoline roller is equivalent to three steam rollers for the rolling of surface-treatment covering. With steam rollers, certainly one-third of the time is given to firing and getting up of steam. Another third is given to taking on water, so at best but one third of the time is left for rolling. I have never been so fortunate as to find a steam roller man who would actually use the remaining one-third of the time in rolling the road. With the gasoline roller the operator must either roll or he must stop. There is no excuse for his not working, and actually they do give much more satisfactory results. Two of the rollers should be kept immediately behind the distributor. The third one should be kept for rolling the material which has been down for one full day.

Covering

The material should be applied to one side of the road at a time. It should never be applied an appreciable distance in advance of the gang doing the covering, and the public should, at all hazards, be kept from using any part of the road which has been treated and which has not been covered, not because of any great damage which may occur to the road, but because of the very great danger of accident should a motor vehicle try to stop on a part on which the material has been spread and not covered. If the bituminous material is covered and thoroughly rolled, within two hours travel may safely go over it. Any time after this the second side may be treated. The bituminous materials, especially the asphalts, seem to cut back previous surface treatments, so that there is apt to be some movement of the cover material for a period of about 48 hours.

Before, during, and after surface treatment, for as long as the covering shows any signs of picking up under traffic, large, legible, distinctive signs should be placed at convenient points along the road to advise the traveling public of just what they may expect. Frequently, where another road parallels the one which is being surface-treated, large signs placed at the intersection will serve to divert most of the traffic to the road which is not being surface-treated. In addition to the signs themselves, a watchman should be placed along the road while the distributor is at work, whose duty it shall be to stop every vehicle and advise the driver that the road is just being sprayed with bituminous material. The public must be satisfied or roads cannot be surface-treated.

The antipathy of the public toward surface-treated roads by modern methods is more imaginary than real. It is but natural that they should long remember their experiences which they had years before in having their car and clothes almost covered with a black substance which smelled very bad and was difficult to remove. They are appreciative of any information as to how best to drive over the roads which are being treated and will generally quickly conform to any reasonable request for regulation of the speed and method of driving.

Gravel Roads

The surface treatment of gravel roads is a problem on which most of the experimental work of which I know has been done by Paul Sargent, of Maine. The material which we have adopted and found most excellent in every respect was developed by him and our method of application and treatment was obtained from him, and I take this opportunity to express my appreciation for what he has done for the surface treatment of gravel roads and congratulate him upon the results. The material which we have used conforms to the following specifications:

Tars only will be used for the surface treatment of gravel roads, and the material shall be homogeneous and meet the following requirements:

1. Specific gravity, 25°/25°C. (77°/77°F.), not less than 1.100
2. Specific viscosity at 40°C. (104°F.), 8 to 13
3. Total distillate by weight:
   To 170°C. (338°F.), not more than 5%
   To 270°C. (518°F.), not more than 32%
   To 300°C. (572°F.), not more than 42%
4. Total bitumen (soluble in carbon disulphide, not less than 90%)

Tests of the physical and chemical properties of the tar shall be made in accordance with the following methods:

1. Specific gravity, Department of Agriculture, Bulletin 314, p. 4
2. Specific viscosity (on first 50 cc.), U. S. Department of Agriculture, Bulletin 314, p. 7
3. Distillation test, A. S. T. M. Standard Test D20-16
4. Total bitumen (soluble in carbon disulphide), not less than 90%

We have had to adjust the use of this material to local conditions, and the results obtained have been highly satisfactory. Under the methods we have used we are obtaining from gravel roads a type of surface which closely resembles macadam, and which in every respect seems to indicate that it will give most satisfactory results for comparatively light traffic.

The gravel roads in Maryland are composed of either screened or pit-run gravel containing 60 per cent of material larger than ¼-inch, the filler being composed of an intimate mixture of sand and clay. These roads under the light traffic for which they were constructed give, we believe, the most satisfactory results of any roads in Maryland. However, where the traffic exceeded about 300 vehicles per day, the dust became very objectionable. The corrugations appeared much more quickly under the heavy traffic and there was considerably more breaking down of the surface, but, on the whole, the dust situation became so acute as to be intolerable. Some of these roads on Sunday are carrying as many as 5,000 pleasure vehicles per 24-hour day. There is, however, almost a total absence of trucks in excess of 3-ton capacity.

Two Surface Treatments in First Season

One application of this material gave no satisfactory results even for the first season. It was necessary in all cases to give two applications in one season, which gave a surface that satisfactorily carried over the winter, and with an additional treatment the second year appeared to be in a position to give at least two, if not three, years of service without an additional application. The material which we used was Tarvia, manufactured by The Barrett Company.

It is self-evident, of course, that the road after surface treatment can be no smoother or more uniform in cross-section than the road before treatment. Needless to say, only a gravel road in very good condition should ever be surface-treated. All weak spots could be discovered and completely removed and replaced with good material at least a month in advance of the first oiling and the road should be kept dragged and graded to a good, uniform condition, free from corrugations and weak spots. A gravel road should be oiled only when dry. It is of course much more difficult to get an untreated gravel road dry. However, it is essential that the surface be dry before the material is applied to it, else it may track up.

Clean Surface Before Treating

A rotary broom is used, supplemented by hand brooms where necessary, to remove from the surface all of the loose material so that the bituminous material may better penetrate into the surface. The first application should be at the rate of ½-gallon to the square yard applied uniformly with a pressure distributor. This application should be immediately covered with the material which is swept off the road, provided, of course, that it is not clay, but a combination of sand and gravel. This would usually be the case on roads under travel, because the action of the vehicles over the road will blow away most of the clay. Such of the covering material as has been carried off by traffic during the first day should be applied again the second day. Special care should be used to cover every spot which appears to be bleeding. These spots should again be covered for the second and third days.

Patching

A traffic of 300 or 400 vehicles per day is usually sufficient to work the cover material into the tar; but if it is not, it may be supplemented by rollers. A small roller of 4 or 5 tons seems to give equally as satisfactory results as the larger 10-ton rollers. After this first application about a month should elapse, during which the bituminous material will "cure" and before the road is ready for a second application. Any weak spots which appear during this period should be immediately patched with a mixture of gravel and bituminous material. For this we have used a standard cold patch material used in Maryland for all types of macadam patching, which is manufactured by the U. C. I. Contracting Company of Philadelphia, and which conforms to the following specifications:

	Min.	Max.
Specific viscosity (Engler), (first 50 cc. 40°C.)	65	75
Bitumen, soluble in CS_2	95	100
Distillation (A. S. T. M.):		
Total oil to 170°C.	3	8
Total oil to 235°C.	8	16
Total oil to 270°C.	17	26
Total oil to 300°C.	23	36
Melting point residue above 300°C. (Ring and ball method, °C.)	35	60

This patching should be carefully done so as to conform to the adjacent surface, so that the road, when the second application is made, will be perfectly smooth. The patches which will be required after the second application are for the most part small, and under no condition should the road be allowed to go unpatched for any appreciable length of time.

The penetration obtained from the first application is no greater than 1 inch, and of course, during the period of "curing" the bituminous material has little or no inherent strength, so that, once a break comes into the surface, disintegration around it is progressive and extremely rapid. For this reason the surface should be thoroughly patched by a patrolman during the entire time.

Second Application

For the second application, better material is required for covering than for the first application. Coarse sand, or a combination of sand and gravel consisting of gravel no larger than ¼-inch should be used. The material should be entirely free from clay. Before the second application, a scraper and a hand broom should be used to remove the loose material and foreign substances which might be on the surface. This application should be at the rate of ¼-gallon to the square yard, spread uniformly and immediately covered with a combination of sand and fine gravel. This material should be kept spread back on the surface as fast as it is pushed off by travel for a period of at least four days after this application.

One of the really essential things about surface treatment of gravel roads is to keep applied to the surface an excess of covering material at all times, so that the maximum amount may be worked into the surface during the "curing" period. If this material is allowed to be kicked off by vehicles and to lie along the edge of the traveled way, it will absorb a considerable amount of the tar which has been applied to the surface, and this will eventually dry out and be of no value. If there is not sufficient traffic and if it is not sufficiently diversified to cover the entire surface, the road should be rolled with a power roller for the first three or four days after application. Where there are as much as 500 vehicles per 24-hour day, there will generally be no need of rolling to work the covering material into the tar surface.

The roads in Maryland treated by this method are not more than two years old, but the results obtained after the last two winters indicate most satisfactory results. The roads which had but one application during 1924 showed a marked disintegration during the spring of 1925, so much so as to lead definitely to the conclusion that one treatment is not satisfactory for the type of gravel roads found in Maryland. Certainly, if those roads with two applications can the first year be made to give service approaching that of macadam roads without the need of scarifying, rebuilding, and retreating in the spring, it will prove much more satisfactory than the one-application treatment, which will require scarifying, rebuilding, and retreating the next year.

The slow-curing asphaltic oils which have given satisfactory results on sand-gravel roads have been a total failure on the clay-gravel roads in Maryland.

ACKNOWLEDGMENT.—From a paper presented before the American Road Builders' Association at Chicago.

Milwaukee's Sewage Disposal Plant Now Producing Commercial Fertilizer

ON February 10, 1926, the activated sludge sewage disposal plant of the city of Milwaukee, Wis., shipped its first carload of Milorganite, an ammoniate fertilizer, consigned to the Worcester Fertilizer Company, Snow Hill, Md. The trade name, Milorganite, is a coined word, selected from a number that were submitted, and means "Milwaukee Organic Nitrogen."

Between February 10 and April 5, twenty additional trial carloads were sent to fertilizer manufacturers in various parts of the country. The production of the plant between the dates mentioned amounted to a little more than 400 tons. Reports from fertilizer manufacturers using this organic nitrogen are very favorable, and apparently Milorganite has already been established as a satisfactory source of organic ammoniate.

Milwaukee's activated sludge sewage disposal plant is the largest of its type in operation. Great care was taken in the design of the plant by T. Chalkley Hatton, Chief Engineer, Sewage Commission, Milwaukee, Wis., followed by painstaking construction, and the tiring, but ultimately successful, problem of tuning up the plant as a dual process, first of sewage clarification and then of fertiiizer manufacture from the activated sludge.

PORTRAYING AN EVENT IN SEWAGE DISPOSAL EVOLUTION AND HISTORY

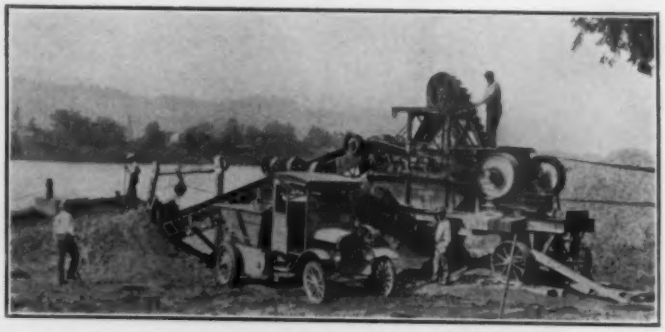
Road Maintenance Equipment---Part II

By Harry J. Kirk
Ohio State Highway Engineer

Road-Bed Maintenance Equipment

Here again the type of equipment depends upon the topography. In Ohio we have everything from the flat plains, a century ago the black swamp of northwestern Ohio, to the hills of southeastern Ohio, which are as rugged as some places in the eastern states called mountains.

In southern and southeastern Ohio we are bothered with slips and slides. The road may slide away or a hill may slip down on the road. It is too expensive to move in a shovel for this sort of small work, and it is agonizing to watch a gang of men shoveling this earth into trucks by hand.



A RUSSELL ONE-UNIT GRAVEL PLANT IN ACTION

No piece of equipment has proved more valuable for this sort of work than a small crane with clamshell bucket mounted on a truck. We own a number of these in Ohio, and while we have some of the half-circle swing type and some with the full-circle swing type, we much prefer the latter for moving slips and slides. Our principal reason for this is that we work with the road open to traffic and the road need not be blocked with the full-circle swing.

A small ditcher, originally designed for cleaning farm ditches, which will do light ditch cleaning, has appealed to me as a good tool, inexpensive and valuable for back sloping and other operations where the superintendent or engineer gets gray-haired watching laborers waste their time.

The one-man motor patrol grader is a valuable piece of equipment for shaping up shoulders.

Cutting Weeds

The best job of grass and weed cutting is done with a farm mower having a 6-foot cutter-bar that will cut at any angle between 45 degrees below horizontal. A machine of this kind pulled by a good team driven by the owner who lives along the road is the best combination for a good, clean, economical job of weed cutting that has ever come to my attention. The trouble is, however, that few farmers have such a type mower and, also, they may be busy at other work when you want your weeds cut.

We have used several types of cutter-bars attached directly to Fordson tractors. We believe, however, that the special highway mower, preferably with cutter-bar that can be raised or lowered 45 degrees from the horizontal, pulled by a team or tractor and operated by a separate man, gets the best job. A team will get into places a tractor cannot, thus reducing to a minimum the work which must be done with scythes by hand.

Gravel and Traffic-bound Macadam Maintenance Equipment

There are two problems to be solved in the maintenance of gravel or stone roads by dragging: (1) keeping the surface smooth; and (2) replacing surfacing material blown away.

There are many ways of keeping the surface smooth. This may be caused by varied conditions such as different gravels and stone, and also difference in the volume of traffic. I do not know of any one piece of equipment that will keep a gravel or traffic-bound macadam road smooth. If a thin layer of gravel or stone can be maintained over the surface, much will have been accomplished. High-speed rubber-tired traffic rapidly throws the material to the sides of the road, leaving the center bare and in condition to go into pot-holes. The loose material should be kept constantly thrown back on the center of the road. The best tool I have ever seen for this purpose is the grader blade mounted on springs and turned to the road surface as a razor blade is to a hone. We used to mount this type of blade on trucks received from the Government, and we still have many so utilized, but the trucks are

A TRUCK-MOUNTED TANK-CAR HEATER

rapidly wearing out and we are now using the same kind of blade in place of the stiff grader blade on the one-man motor grader.

This spring blade carried along the road at 10 to 12 miles per hour will do a very good job of throwing back to the center of the road and covering the surface with a uniform layer of loose material. But this sort of operation is not enough. The large sled drag is indispensable, if you are to get a smooth riding surface. As compared with the grader blade it is the same as the carpenter's plane compared to a draw-knife. These sled drags should be used every few weeks and when the surface is in proper condition to do the most good. With proper equipment and correct manipulation of materials, a gravel road can be made as smooth for riding as any hard-surfaced pavement ever built, and much smoother than the average built in the past.

Now let us consider the matter of replacing surfacing material. This problem may be handled in three ways: (a) it may be shipped by railroad from commercial plants; (b) gravel may be obtained from gravel-pits, or stream deposits; (c) a local stone quarry may be used to supply stone.

Where materials are unloaded from railroad cars, car unloaders and trucks are necessary equipment. In Ohio we contract with trucking companies for this sort of work.

One very satisfactory piece of equipment for this sort of a job is the one-unit gravel crushing, screening and loading plant. Material is delivered to a belt conveyor, usually by a dragline. It is then elevated to screens and oversize material turned into the crusher. It is finally delivered to the waiting truck by means of a belt conveyor. No other piece of equipment equals it in performance, compactness, and portability.

Recently developed equipment valuable in gravel-pits includes belt conveyors, bucket loaders, and truck-mounted clam-shell cranes. Dragline outfits can be used in many places to good advantage, depending on the depth, area covered, and over-burden of the gravel deposit being worked.

In some districts where there is no gravel it is possible to crush and screen local limestone. For a small operation an air-compressor operating drills is very handy. For larger operations a well drill should be used for blasting holes. The best quarry arrangement is where the crusher can be placed much lower than the quarry floor. The stone may then be chuted to the crusher platform into the crusher and then elevated to the storage bin. I have seen cars with small-gage track and Fords with gravity dumps used to good advantage on local limestone quarries, depending on conditions. We prefer the gyratory type of crusher generally because it produces a more uniform size and has low upkeep.

Bridge and Culvert Maintenance

Bridge and culvert maintenance is sometimes sadly neglected, particularly the repainting of steel bridges.

I have heard arguments pro and con on the use of sand blast for cleaning and the air brush for painting steel bridges, as against hand methods. I believe there is a place for both. Inaccessible places are best taken care of by the sand blast and air brush. On the other hand, a better job is obtained with the paint brush on accessible surfaces. Much depends on the personal skill of the operator. The paint spray frequently causes damage to the finish of passing motor vehicles. Both methods are being used with success.

In each division in Ohio we are employing one gang and in some divisions several gangs as part of our maintenance organization, exclusively on the extension of small culverts and the rebuilding of small bridges. Concrete bridge work requires experience and skill. We use concrete mixers mounted on rubber-tired trailers, easily portable, and other equipment necessary in enlarging and rebuilding these culverts and bridges.

We have found the cement gun a valuable unit for economical repair of certain kinds of masonry abutments.

Equipment for Maintenance of Various Types of Pavement

Macadam Maintenance.—The largest piece of equipment used on macadam maintenance is the motor-truck tank distributor for applying bituminous surface treatments. There are several good distributors on the market that will handle materials, both for cold and for hot application. The tendency has been to simpler design, fewer pipes, etc. A recent development is the use of a separate motor for pump operation. This is especially valuable on penetration work and in hilly sections.

For cleaning the road surface a good Fordson sweeper combination is on the market, built stronger than the old horse-drawn sweeper. This design has the broom back of the operator, which is a distinct advantage.

The biggest part of macadam road patching today is with bituminous materials. Tilting-drum type mixers with skip are preferred for mixing stone and bitumen, because they clean easier.

I have found the small Fordson type roller, of which there are several makes on the market, a labor-saver in places where there is extensive patching. It can be easily loaded into a truck and cheaply transported from job to job.

Heating kettles of two-barrel capacity are well adapted for macadam maintenance. We buy them in all cases equipped with oil burners. This feature is well worth the extra cost, as it eliminates much loafing waiting for the kettle to heat up. There have been some accidents due to exploding gas from heaters, but this can be avoided with proper care.

Concrete, Brick, etc.—The air-compressor with paving breaker is the most recent development for concrete road repair where replacements are necessary. This applies to all concrete base pavements.

The same recommendation for heating kettles as mentioned under macadam applies to concrete and brick pavement repairs.

A special air hammer mounted on wheels is the best tool we have seen for taking down high spots or raised joints on concrete pavements. We have seen an attachment for Fordson tractor with revolving grinding wheel, but this is not nearly so fast as the air hammer recently developed.

There are several other classes of equipment, such as for snow removal, proper machinery and tools for garages, etc.

Outstanding Equipment

I will name what to my mind are some of the outstanding pieces of equipment valuable on maintenance work.

There is the Ford truck. It is low in first cost. In many places it could replace some of the war-time junk still called trucks at a fraction of the operating cost. On hauls up to 3 miles it is the most economical. Over that it fails. On hills and in hard going the cooling system fails. In Ohio we equip all new Ford trucks with auxiliary transmissions. There is no use overlooking the low cost of repair parts and the ease of handling Ford trucks.

I feel like saying a word here for the small elevating grader, particularly for the operation of widening old road-beds and cleaning ditches.

The one-man power grader is a comparatively new development that has great possibilities.

The belt conveyor for car unloading and the cheap handling of materials out of gravel-pits is a good tool in first cost and easily portable.

ROOT SPRING BLADE ON NASH QUAD, DRAGGING GRAVEL ROAD

The truck-mounted crane is a great piece of equipment. We have used them for moving slips and slides, earth excavation of various kinds, handling materials from cars, gravel-pits and creek-beds, pile driving, handling culvert pipe, and other of the numerous jobs a crane can do.

The use of the air-compressor as a source of power on road repair operations has great possibilities, limited only by the development of auxiliary tools. Today we have paving breakers, air brushes for cleaning and painting, the sand blast, the air hammer for smoothing concrete, air drills for light rock work, and riveting tools, and no doubt other tools will be developed. It meets one of the fundamental requirements so desirable in road repair equipment, it can do many different kinds of work.

The Motor Truck on Road Repair

I value the Ford truck highly for hauls up

A BYERS TRUCKRANE ON A MACK TRUCK AT WORK IN A GRAVEL BANK NEAR ST. JOSEPH, OHIO

to 3 miles, hauling men and light patrol work. For general maintenance work I would buy a 2- or 2½-ton truck, pneumatics all around, dump body and hydraulic hoist with full cab.

On long hauls over good roads, bigger trucks may be advisable, but I believe this sort of work is more economically contracted. We cannot afford to buy these trucks in Ohio when haulage contractors will do the work for less than our costs.

Conclusion

With an Ohio road contractor I stood on the balcony of the Coliseum at the Road Show in Chicago. We were looking down on a magnificent array of road-building equipment, estimated to be worth $3,000,000. I remarked to him, "What would some of the old 'sidewalk' contractors say if they could see this?" The contractor, ever with the point of view of his tribe, replied, "I am wondering what a man would do who had it on his hands with no work to do." The moral of this story is: Don't tie your money up in expensive equipment unless you have work for it to do.

Contractors must obey this rule or go out of business. Public officials must follow it or be kicked out of office. The justification for buying equipment depends on the economy of what it will do as compared with other methods.

On public work and particularly on highway maintenance work there is another very good reason for the extensive use of labor-saving equipment.

Almost all road repair operations are carried on with the road open to traffic. The work is done under the eye of every passer-by. The farmer, not very prosperous these last few years, is especially critical. Every time a laborer, even for a moment, rests on his shovel handle, several heavy taxpayers see him. And you know what happens. We depend upon public opinion for the support of an adequate highway program. I am therefore in favor of keeping the number of public employees on rural highways down to a minimum. Labor-saving machinery is the best way to do this.

The volume of road maintenance and repair work on highways is growing by leaps and bounds. It offers a field of opportunity for the road equipment manufacturer and the road contractor.

The greatest loss in connection with equipment generally is the loss when it is not working. The purchaser of equipment, therefore, be he public official or private contractor, must know that he has superintendents with ability and finances adequate to make that equipment earn more than it cost. I say this because no equipment can take the place of the man who has good judgment, initiative, and energy to do things.

ACKNOWLEDGMENT.—From a paper read before the Twelfth Annual Road School, at Purdue University, 1926.

Portland, Ore., Installs High-Intensity Street Lighting

Details of New System, Including Illumination Values, Method of Distribution, Type of Units and Cost

By F. H. Murphy

Illuminating Engineer, Portland Electric Power Company, Portland, Ore.

WITH the completion of a new high-intensity street-lighting system on Broadway, Portland, Ore., this city now boasts one of the best-lighted streets in America. The new system consists of 106 two-light standards with 1,500-candlepower lamps giving an illumination of 8.66 lumens per square foot of street area. The system extends from Jefferson Street on the south to Hoyt Street on the north, a distance of about one mile. The standards are installed six to the 100-foot block, three on either side of the street and opposite each other. This gives a spacing of about 98 feet between standards in the block, and 65 feet at street intersections, while across Broadway the spacing averages about 55 feet. More intensive lighting is therefore provided at the street intersections, where it is most needed.

BROADWAY, PORTLAND, BEFORE THE NEW LIGHTING SYSTEM WAS TURNED ON

Union Metal standards, Type 1747, were selected for this installation. Each standard consists of a cast iron base, a pressed steel shaft overlaid with a sheet of 16-ounce copper and surmounted with a cast iron top with two arms for the two lighting units. The lighting units used are G. E. Form 12 ornamental Novalux units with rippled medium alabaster globes and canopies. Each lighting unit contains a 20-ampere, 15,000-lumen, 1,500-candlepower series lamp, designed for base-down burning. The lighting center of this unit is 19 feet above the street.

BROADWAY, PORTLAND, AFTER THE NEW LIGHTING SYSTEM WAS TURNED ON

A subway vault in Stark Street about midway of the system contains six 40-kw. constant-current transformers; three of these control the lights north of this point, and three south of it. One transformer in each group supplies two standards at each intersection, one at the northwest corner and the other at the southeast corner. The center transformer supplies the two remaining standards at each intersection, and the third transformer supplies the two standards in the middle of each block. At the present time all standards are

COMPARATIVE DATA ON SOME OF THE BEST-LIGHTED STREETS IN AMERICAN CITIES

Location	Type of Unit	Width of Street, Ft.	Approximate Spacing of Posts	No. of Light Units per Post and Size in Lumens	Lumens per Running Ft. of St.	Lumens per Sq. Ft. of Street Area
Market St., San Francisco	6.6-amp. luminous arc	120	110 ft. Opposite	3—13,700	750	6.25
Main St., Salt Lake City	6.6-amp. luminous arc	110	110 ft. Opposite	3—13,700	822	7.47
Broadway, Los Angeles	6.6-amp. luminous arc	100	106 ft. Opposite	2—13,700	510	4.81
Broadway, Saratoga Springs	6.6-amp. incandescent	150	134 ft. Opposite	2—10,000	300	2.00
State St., Chicago	1,000-watt multiple	100	100 ft. Opposite	1—19,500	390	3.90
Market St., Lynn, Mass.	6.6-amp. luminous arc	57	78 ft. Staggered	1—13,700	359	6.30
Broadway, Portland, Ore.	20-amp. incandescent	80	100 ft. Opposite	2—15,000	693	8.66

lighted until one A. M. each night, and two standards at each intersection remain lighted until morning.

Distribution from the subway transformers to the light standards is by means of No. 8 solid single-conductor armored parkway cable installed in the street. The cable enters the base of the lighting standard, where it passes through a Westinghouse disconnecting pothead, thence to a Westinghouse two-coil series transformer. Two secondary windings are provided, one for each of the two lamps on the standard. The transformer changes the high-voltage, 6.6-ampere distribution current to a low-voltage, 20-ampere current for the lamps. This provides a safe low-voltage circuit in the post and a large current for the lamp, which permits the use of a more rugged, high-efficiency lamp, and the two windings permit each lamp to operate independently of the other.

The new Broadway system cost the property owners approximately $50,000, including the 6 per cent engineering charge made by the city on all street improvement work. The cost of maintaining the system, including the energy for lighting, the renewal of lamps, cleaning of glassware, painting of cast iron parts, replacement of all breakage, and general maintenance of the system, will approximate $12 per month per standard. For this outlay the property owners have one of the best-lighted streets in America. Not only is there an abundance of illumination on the street, but the faces of the buildings are also well lighted, and on this particular street such a feature is of considerable importance.

About a year ago at a general election the city voted to place street lighting, both installations and maintenance, upon a basis similar to that of paving, so that any street desiring such improvements could establish itself as an improvement district. In this way the lighting would be continuous and uniform throughout the district, and the property owners could be assured of continuous maintenance over a period of years. Under the provisions of this new charter amendment it is possible for any lighting district to bond itself for such an improvement as well as for the maintenance of the installation over a period of not to exceed five years. This has proved to be a great incentive toward better street lighting, as a number of other streets have the matter under consideration at this time, one of them having advanced so far as to call for bids on the work.

The former lighting system on Broadway consisted of 5-light cluster posts with a light center only 13 feet above the street. The spacing of the posts was the same as in the new system, but the lighting units were too low, and even when all posts were fully lighted, the illumination per square foot of street area was only approximately one lumen, whereas the new system provides 8.66 lumens per square foot, or almost nine times the amount of light formerly obtained.

The table at the top of this page shows a comparison of the lighting features of Broadway, Portland, and some of the best-lighted streets in other cities.

ACKNOWLEDGMENT.—Printed through the courtesy of the author and the *Electrical World*.

SOME STATES IN DEATH REGISTRATION AREA WHICH ARE NOT IN BIRTH REGISTRATION AREA

In a letter to The American City, expressing the appreciation of the Bureau of the Census for the publication of the article entitled "No One Knows How Many Births and Deaths Occur Annually in the United States," (page 558, issue of May, 1926), Dr. William H. Davis, Chief Statistician for Vital Statistics, calls attention to the distinction between the birth and death registration areas. As indicated in the May article, the map there published showed the birth registration area of the United States. This includes 33 of the 48 states. The death registration area now includes 40 states, the District of Columbia and 24 cities in non-registration states. The vital statistics goal of the Bureau of the Census is "Every State in the Registration Area Before 1930."

Science Demands Another Step Forward in City Milk Control

By B. L. Crandall

MILK is naturally more susceptible to contamination than any other food. In addition to being an excellent food, it is also a fine medium for bacteria which cause disease. In the last half-century milk has been found to be the carrier of germs which have caused wide-spread epidemics of typhoid fever, septic sore throat, diphtheria, scarlet fever, and other ailments. In fact, science has shown that milk and water have been the carriers of the causes of more deaths and sickness than any other two agencies known to man.

Bacteriological and medical researches of late have revealed that among humans there are certain individuals who are termed "carriers." Such a person has in his system, as the result of recovery from the disease, the germs that cause typhoid, diphtheria, and possibly other diseases—but does not fall victim to it himself. His own immunity is strong enough to throw off the effects of these organisms and he does not become ill, but he may spread the disease.

When such individuals are engaged in the handling of milk before it is bottled, they present a real menace to the milk-consuming public. They are continually throwing off the disease germs, which find in milk an almost ideal place for multiplying. These are passed on to the consumer, who falls heir to them. There are numerous cases on record where milk consumers in large numbers have become ill with no apparent reason. When careful investigations were made, it was found that some handler of the milk before it was bottled was a carrier of germs identical with those of the sick persons, and, though not himself ill, was the cause of the trouble.

This, then, points out a step which city health boards must take if they are to control the milk supply and assure consumers that it is safe. Ways and means must be devised for frequent and thorough examinations of all persons who handle milk. Regulations at present are aimed to prevent persons who have communicable diseases in their homes or families from coming into contact with milk for human consumption, but these regulations do not go far enough. There may be no disease in the family or home, but the germs may be there in the persons of the milk handler. These must be killed by serums or other anti-bodies, and until they have disappeared, the carrier must be prevented from touching milk.

Practically all milk boards appreciate the importance of clean cows, clean utensils, and careful handling of milk, and have enacted regulations to prevent the delivery of particularly unwholesome milk. No longer are such mixtures as calves' brains, chalk, sugar, and water delivered to urban consumers. In the last few years, much has been heard about physical examinations of cows, and especially tuberculin tests, as measures aimed to improve the quality of milk and prevent infection of humans. Most cities and villages have regulations requiring periodic examinations of all cattle supplying milk to them, and some have enacted rules stating that only milk from tuberculin-tested cattle shall be sold within their borders.

It is true that sick and tuberculous cattle are a menace, but the latter are not as great a danger as they have been painted. Humans,

The Human Element in Safe Milk

Making milk clean, wholesome, and safe for human consumption is the main object of city milk regulations and the excuse for having city milk boards. In recent years, municipal ordinances and health boards have worked to bring about a marked improvement in the milk delivered in cities and villages, but science now demands another step forward. This step is really a double one and calls not only for more thorough examination of the cows which supply the milk, but, most important of all, consideration of the health of all persons who handle milk before it reaches the consumer.

The accompanying article on this important subject has been prepared by the writer from a talk given by Dr. V. A. Moore, Dean of the New York State Veterinarian College at Cornell University; to a group of dairymen during Farmers' Week.

and especially those over sixteen years of age, are not especially susceptible to bovine tuberculosis. Careful investigations show that only a small percentage of all adults over sixteen who are affected with tuberculosis have the bovine variety. However, this percentage is great enough to warrant a careful check-up of the health of all cows whose milk is used by human beings.

Accepting the premise that it is the aim of city milk control to provide safe milk, scientific research shows that milk boards should require more frequent examinations of the cattle which are supplying their communities. The usual plan of yearly physical examinations is not sufficient, as it is entirely possible within the twelve-month gap for a cow to develop some ailment which renders her milk unfit for safe consumption. The dairyman cannot always be depended upon to remove from the herd an unfit animal or to keep her milk from being put in with the rest from the herd. One milk company which serves a big metropolitan area has come to realize this fact and is considering the employment of a veterinarian to make daily examinations of cattle supplying its highest grade of milk. If the middleman has seen the light, health boards with their larger responsibilities to the public should certainly look for it.

Contrary to early beliefs, milk does not come from the cow in a sterile condition. Freshly drawn milk contains germs of various kinds, but these are not particularly harmful if the cow is healthy. It is for the purpose of keeping cows with healthy udders that frequent examinations should be made of cattle.

Whether or not the germs naturally found in milk are harmful, precautions to make it safe cannot properly stop with the use of sterilized utensils in handling it. Every known safeguard must be thrown around milk. The best method yet devised to make it safe for human consumption is pasteurization. This kills bacteria and germs if properly done, but frequently unskilled or careless workmen are in charge of pasteurizing equipment. Their lack of skill and carelessness may be the undoing of many consumers. It is because of this that more attention to the cows and the humans handling their milk should be the aim of city milk control.

The War Memorial Chimes of Pickaway County, Ohio

THE little city of Circleville, well known in Ohio for its love of the beautiful, installed in the tower of the Court-House, on April 24, 1926, a chime of eleven bells, the gift of William Foresman to the city in memory of the soldiers of Pickaway County who gave their lives in the World War.

The total weight of the bells is 18,000 pounds, the largest weighing 2,100 pounds, the second, 1,500. They are now played from a console in a room directly under the bells, but the city will furnish an electrical appliance (at a cost of $1,500) by which the chimes may be played from the home of the musician.

On each of the three large bells has been placed an inscription. These are as follows: "To live in hearts we leave behind is not to die"; "To the glory of God and the honor of Him from Whom all blessings come, these bells were given by William Foresman, A. D. 1926"; "Praise God from Whom all blessings flow."

At a sacred concert given Sunday morning, April 25, Mrs. Nannie Forseman, widow of the donor of the chimes, played the first number, "My faith looks up to Thee," which was touchingly beautiful. Crowds stood in the street listening. Whenever the time of the music comes—at ten, mornings, and at dusk, evenings—all faces turn toward the tower.

G. B. ALLEN.

Does Drastic Punishment Curb Crime?

ADMITTING for the sake of argument that the crime wave exists, is more drastic punishment the way to curb it? Ever so many highly respectable people nowadays are saying that it is. Yet one weak point exists in their chain of arguments which we think has not been pointed out. If punishments are made more drastic, you must not only make sure that potential criminals know this has happened: you must also make sure that potential criminals have enough intelligence to think ahead and weigh the increased risks they now run. On this matter of their ability to perform such a feat in logic, the National Committee for Mental Hygiene has some interesting facts to contribute. More than 8,500 prisoners in eleven states were recently given careful tests. Of these one-twentieth were found to suffer from some definite and serious mental disease, such as dementia præcox or paranoia. Another eighth were mentally defective, and an eighth more were what are called "borderline cases." Nearly another fifth were psychopathic persons, described as being defective to a degree which seriously impairs their moral sensitiveness, although their appearance is sufficiently normal so that judges and juries usually hold them to be "sane" and responsible. In other words, more than half of these prisoners are mentally abnormal, which raises two interesting questions: Would increased severity of punishments be any deterrent to such individuals? Do any punishments, no matter how drastic, ever prevent their committing crimes?

—From *The New Republic* for May 5, 1926.

Water-Works Pumps and Pumping-Stations

By Robert W. Angus
Professor of Mechanical Engineering, University of Toronto

ONE of the most important features of a water-works system is the pumping-plant, and it is often the part to which least attention is paid. If this plant has not been well selected and placed, one is not only confronted with a large expenditure for power and attendance, but may also suffer from lack of water, or from low pressure, at the critical moment.

Not so very many years ago the reciprocating pump was the only type used for this purpose, the source of power being either a steam engine or a hydraulic turbine, and a number of smaller stations are still operating in this way. Some of the larger stations also use the reciprocating unit to a very large extent, and Toronto still has a large installation of them, although all have been in use for many years and are not new.

Milwaukee has very recently installed a number of vertical triple expansion units of large size, and these have shown very high efficiency, although when reduced to the same steam conditions, the results are identical with those on a similar unit in Toronto, tested by the author in 1906. The Toronto machine established a record for duty, exceeding 172 millions of foot-pounds per 1,000 pounds of dry saturated steam at 150 pounds pressure, and showed a mechanical efficiency as between steam indicator diagrams and suction and delivery water pressures of 96 per cent. None of the other types of pumps have given anything like such good results since.

The smaller steam-driven reciprocal units are often very wasteful, because of leaky plungers, leaky valves, tight glands on the rods, etc., so that careless operation may bring their efficiency down below 50 per cent.

Centrifugal or Turbine Pumps

The centrifugal, or turbine, pump has very largely displaced the plunger type in all large steam-driven sizes, and lends itself to high speeds of rotation, making it suitable for direct steam turbine connection. The efficiency of these pumps has shown a very rapid increase, and the duty of steam-driven units has risen about 50 per cent in the last twenty years. They are relatively low in cost, occupy a small space, require little attendance and upkeep, and have a long life.

The adoption of centrifugal pumps in America has almost entirely come within about twenty years. Like all new machines, they made very slow headway at first as they were difficult to take apart and repair, their properties were not well understood, many of the earlier machines had very low efficiency, they did not give the required discharge, and had a short life. Some of the early purchasers had good reason to regret their action.

The pumps had so many advantages that builders quickly put them into a practical shape and today they virtually control the water-works pumping field. The earlier units rarely gave efficiencies exceeding 70 per cent, while large pumps have recently been made with 86 per cent efficiency. One of the important developments has been the adoption of the single-stage pump for a wide range of conditions, and there is a tendency today to increase the speed sufficiently to make single-stage pumps serve for high heads.

The adoption of a single stage simplifies the mechanical construction and reduces the cost, and gets away from many balancing problems. Builders very largely omit the guide ring, so much in use at one time around the outside of the impeller. This is also an advantage to the purchaser, as the ring always gives some trouble from leakage, and its angles are suited only to a single discharge condition, although the range of discharges actually varies greatly in the same pump.

The use of the horizontally split casing has done much to popularize these pumps, as they may now be examined internally with great ease; and further, the use of impellers which give very flat power curves has proved a good asset. Pumps are now very largely made with this characteristic, the maximum power for driving corresponding to the discharge for best efficiency, and on each side of this point the power falls off.

At the present time there is room for further development of the high-speed, low-head pump, only one or two makes of such machines being on the market now. The author recently ran a test on a pump for about an 18-foot

head, driven by a motor at 250 r.p.m., proportions causing the designer some difficulty, although fortunately the capacity of the pump was large. A very much more compact unit could have been made had it been possible to run at, say, six times the speed, and it is likely that further development of machines to suit these low heads will be made. One such pump, with a screw type impeller, is in the Hydraulic Laboratory of the University of Toronto, and gives the required head of 12 feet and discharge of six million Imperial gallons daily, at 1,500 r.p.m., with very good efficiency.

Pump Drives

Reciprocating steam engines have been very little used for driving centrifugal pumps, except through belting, because of the relatively low engine speed and relatively high pump speed. A very common drive now is the steam turbine, which is direct-connected, but the steam consumption on small turbines is excessive and they are therefore rarely used for the smaller units.

The standby losses on steam-driven units is very high, the coal used for banked fires being often more than that used for pumping where some auxiliary plant is available, and for these and other reasons not necessary to discuss, steam stations are decreasing in Ontario.

Electric motors are now one of the most common sources of power for pumping, in this district, and they serve splendidly for direct connection. One fault with them is that they are frequently too small for their work, and run too hot. This is largely due to the fact that the pump either exceeds its capacity at given pressure, or is low in efficiency, or else is running at too high a speed. The purchaser is frequently so pleased, in the first case, to get more than he is paying for, that he does not realize the load being put on the motor. Low efficiency is usually a cause for rejection, but the author has come across so many cases where speed much exceeded that stipulated, that he feels attention should be given to this matter.

It is not unusual to find a pump, purchased for a speed of 1,750 r.p.m., running at 1,800 r.p.m., on account of electrical conditions, and this results in a power increase ratio of $\left(\frac{1800}{1750}\right)^3 = 1.09$, or an increase in demanded power of 9 per cent. If, in addition, the pump is high in capacity, it is clear that the motor will carry an undue overload. For these reasons, the motor should have an excess of 15 or 20 per cent of power over that expected for the pump.

Centrifugal pumps must be primed and are very sensitive to the presence of air in the suction, so that, if poorly set, they may entirely lose their suction and run dry, causing considerable danger to seizure inside the pump, as it is ordinarily made. It is very desirable, therefore, to set the pumps as near as possible to the suction well, preferably so that they will be below the well level, and any gain that may be possible in the lowering of the pump is generally justifiable. A long suction pipe is also to be avoided.

For standby service, one of the most suitable pumping units is the direct-connected centrifugal pump and internal-combustion engine. So far, gasoline has been largely used for fuel, since engines using it may be run at high speed, but heavier oils are also being used and adapted to such service, and are safer, and cheaper in fuel costs, and give no difficulty in operation. One unfortunate condition, all too common with such units, is that their setting sometimes causes them to be very noisy, and at times dangerous. Cases are not unknown where the hot exhaust pipe has set fire to the pump-house.

Noisy operation can be avoided, and engineers would do well to realize that good work will not be done by the operator in a noisy pump-house, and they should therefore deliberately plan to have a quiet unit.

Water and Power Meters

Every pumping-station should be equipped with a proper meter for the water as well as for the power supply, and there is certainly nothing better for the former than the venturi-type meter, now manufactured by two different companies. The device is remarkable for its accuracy and enables the operator to keep a record of his output and efficiency, and every effort should be made to have this carefully done.

Most operators have ample time and facilities for keeping the stations and machines clean and free from rust and other objectionable matter. Polished surfaces should be kept bright and should not be painted, and the pump-house should be designed with good light and plenty of space. Under such conditions the operator will usually take so much pleasure in his equipment as to keep it in the best of condition.

ACKNOWLEDGMENT.—From a paper read before the Canadian Section, American Water Works Association.

Ten Years of Service of Thin Brick Pavement

Interesting Report on 2½-Inch Brick Pavement in Omaha, Nebr.

IN 1915 Omaha, Nebr., paved Parker Street between 29th Street and 33rd Street with 2½-inch plain wire-cut vertical fiber vitrified brick on a 5-inch concrete base of 1:3:6 mix and a 1-inch sand bedding course, using asphalt filler. Parker Street leads from an outlying business district through a residence section and would be classed as a medium-traffic street. From 29th to 32nd Streets the grade is about 5½ per cent. The remaining block is level. Just previous to being paved the street was heavily graded. As it was a hillside street, there was about 50 per cent fill and about 50 per cent cut. The soil is a hard clay, which meant difficulty in compacting the fills. There has been some settling of the subgrade during the ten-year life of the improvement. The accompanying photographs give some idea of the present condition of the street.

John M. Egan, Chief Engineer, Midwest Paving Brick Manufacturers Association, made a recent survey of this pavement and reports that the present condition of the pavement is very good for one which has been in use over ten years. There are a few imperfections. There are three small transverse curbs on the heavy grade section. These humps are over filled sections, the fills averag-

CLOSE-UP SHOWING CONDITION OF 2½-INCH BRICK, AFTER TEN YEARS' SERVICE

PARKER STREET, OMAHA, NEBR., PAVED WITH 2½-INCH VITRIFIED BRICK IN 1915. PHOTO TAKEN IN 1926

ing 9 feet in depth and having a maximum depth of 17 feet. These humps are not at all serious and could easily be repaired. The fault is apparently with the substructure, since the brick in the surface seems to be perfect. There are a few cracked brick on the level portion of the pavement. This section also is constructed over a heavy fill. There are very few brick that show any disintegration. All of the asphalt filler is worn off the surface. Considering construction difficulties on this job, the present condition of the pavement is a real commendation for the 2½-inch brick surface.

Street Cleaning in Minneapolis

IN Minneapolis, sprinkling of the paved streets has been entirely dispensed with, according to W. J. Walsh, Assistant Engineer in Charge of Streets. There was a time, especially in the downtown district, when the streets were flushed six nights a week and water sprinklers were out all day long, and it was found to be injurious to the pavement. On the paved streets, especially where there are car lines, it has been found possible to dispense with several of the flushings. Some of the pavement is now flushed only twice a week, but this pavement is cleaned every night with pick-up sweepers. It has been found that outside of the car-line streets, most of the accumulation is along the gutter, as traffic gradually works dirt and refuse toward the curb. With one round of the pick-up sweeper on these streets, practically all of the dirt is taken up. Since this system of not sprinkling the paved streets was inaugurated, there have been no complaints.

In the daytime the streets are safe for traffic and not continually being spread with water, making them dangerous and in a slippery condition for traffic.

Educating a City to Use Water-Meters

THE Twelfth Annual Report of the Water Department of Kalispell, Mont., for the year ending December 31, 1925, is a very interesting document. We are quoting two paragraphs on water-meters from it, which show how the water-works officials are endeavoring to educate the citizens to a better appreciation of the value and equitableness of metering water:

"The meter is a much maligned and little-understood measuring instrument. Scales, yardsticks, soda water glasses, bottles and watches, we are inclined to accept with confidence, probably because we can see the process of measurement, and in the meters we cannot. The U. S. Bureau of Standards reports that the water-meter is the most accurate commercial means of measurement known. Water-meters date back many decades, but as recently as 1891 there were only 165,000 in use in the United States, compared with about 2,215,000 taps. Only 37 cities had 50 per cent or more of their taps metered in 1891. Since then the number of meters has multiplied many times, and now there are hundreds of works with from 90 to 100 per cent of their services, both domestic and industrial, metered.

"We regret that we cannot report all services metered. We inaugurated the meter system during the year 1914, making it compulsory for all places of business to install meters, leaving it optional for residences to continue under the old franchise flat rate, or take advantage of the substantial reduction that our meter-rates offer. No one will take issue with the statement that a measured rate is more just, more economical from the standpoint of both buyer and seller, and more scientific than any flat rate that can be devised. To object to the use of a meter is substantially to prefer the methods of antiquity and to oppose modern methods which years of study and experience have developed. We advise all unmetered consumers to have meters installed at once—your monthly statement will show a substantial reduction. During the past year there have been 51 meters installed, making a total in service December 31, of 1,193."

Is a City Liable for Water-borne Typhoid?

ACCORDING to Homer O. Blair, consulting engineer, Tacoma, Wash., the Supreme Court of the state of Washington has recently rendered decisions in two cases confirming judgments of the Superior Court of Snohomish County for damages granted by juries for wrongful deaths of persons alleged to have died from typhoid fever contracted by drinking water furnished by the city of Everett. . . .

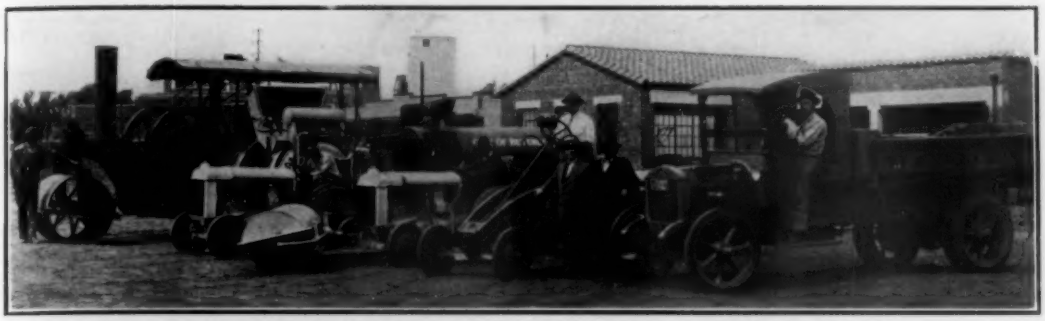
The record shows that, within a comparatively short time during the summer of 1923, there were about eighty cases of typhoid fever and a number of deaths therefrom in the city, on account of which a number of claims or suits have been filed against the city. . . . The complaint charged that the condition of the water was known to the defendant, its officers and agents who were charged with the duty of keeping and maintaining the water in a pure condition, or with the exercise of reasonable care and inspection would have known the condition of the water. . . .

In these cases it was established that polluted water was permitted to pass into the city mains through a by-pass connection at an industrial plant. . . .

The city insisted that the complaint was drawn on the theory of an implied warranty, and argues strenuously that the city in furnishing water to its users does not guarantee its purity and wholesomeness. . . . While both cases hold that a city furnishing water to its inhabitants does not impliedly warrant that the same is pure and wholesome, yet both of these cases recognize the failure properly to inspect the water so as to keep it free from contamination is negligence. There is ample authority that a city engaged in furnishing water, electricity or other kindred services to its inhabitants for a profit is liable for negligence the same as any private corporation engaged in the same business; that the city does not act in a governmental capacity, and that there is an implied warranty that the water is fit for human consumption. . . .

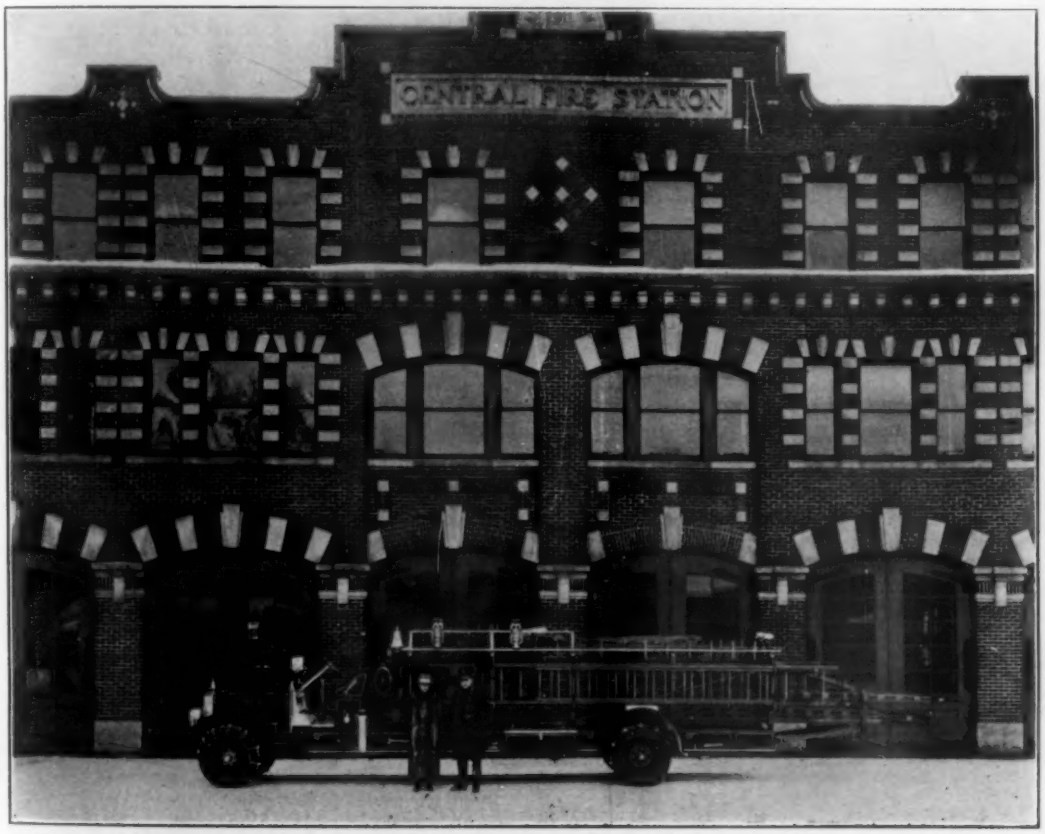
—*Health News*, New York State Dept. of Health.

East and West Continue to Install Motor Equipment



A PORTION OF THE EQUIPMENT OF THE STREET DEPARTMENT OF BEVERLY HILLS, CALIF.

We are indebted to J. C. Albers, City Engineer of Beverly Hills, for the photograph above. In 1923 the equipment of this department consisted of one Ford truck. Today it consists of one 13-ton Austin roller, one 2½-ton Diamond-T truck, one 2½-ton GMC truck, three 1-ton Ford trucks, one 600-gallon water tank, one 1,200-gallon water tank, one Hadfield-Penfield Fordson grader, and one 3-ton garbage truck with tanks. The Street Department also operates a complete blacksmith and machine shop and takes care of all maintenance equipment from all departments of the city



A NEW CITY SERVICE TRUCK RECENTLY DELIVERED TO THE BUREAU OF FIRE, UTICA, N. Y., SHOWN IN FRONT OF THE CENTRAL FIRE-STATION AT UTICA

Joseph N. Sullivan, Chief Engineer, Utica Bureau of Fires, is seen at the right, and Lester J. Creaser, Manager, Utica District Sales Office, Foamite-Childs Corporation, manufacturers of the truck, at the left

MAP OF PROTECTED-TRAFFIC AREA, JACKSON, MICH., SHOWING LOCATION OF SIGNALS AND RELATIVE LENGTH OF EAST-AND-WEST AND NORTH-AND-SOUTH BLOCKS

Approximating No-Stop Traffic in Jackson, Michigan

By George F. Stecker
President, Jackson Safety Council

THE problem of traffic regulation in our cities has assumed gigantic proportions. Much of the attention, however, of those who are foremost in its solution has been confined to the metropolitan districts, where the problem is most acute. By comparison, the traffic problem in the relatively small city is not so great, yet there is at least one center in almost every town where the congestion and consequent accident hazard are fully equal to those of most intersections in a metropolis. Experience has shown that the difference is not in kind, but in degree, in that the small city has but one or very few of these centers of congestion, while there may be scores of them in the larger city.

Jackson, Mich., is one of the smaller cities that have taken up the problem of traffic regulation and safety and are making progress toward its solution. Jackson is a city of 55,000 inhabitants, but a considerable increase in population is expected in the near future, carrying with it a corresponding increase in the traffic hazard. M-17, the main trunk line highway between Detroit and Chicago, is routed over Michigan Avenue, the principal east-and-west thoroughfare; while M-14, the main artery of north-and-south traffic through the center of the state, is routed over Blackstone Street, at the west end of the business district.

During the summer months the through traffic on these two main thoroughfares, which is increasing year by year, adds greatly to the problem. With the steady increase in the number of motor vehicles on the streets and also in the number of incompetent and reckless drivers, the city authorities found themselves confronted with a problem that called for collective action and cooperation between the city authorities and the various agencies working for civic betterment.

Adequate law enforcement is difficult without a preponderance of public opinion in its favor. To arouse this favorable public sentiment and cooperation, the Chamber of Commerce brought about the formation of a local Safety Council, affiliated with the National Safety Council, which includes among its other activities the study of the traffic problem and the promotion of public safety.

Manual Control Unsatisfactory

The city had originally tried to regulate its traffic by officers stationed at the busiest intersections. At first they were on duty only during the rush hours. Then, as the increase in traffic demanded continuous rgulation, booths were erected in the center of the intersections. These booths figured in a number of serious accidents, reckless drivers colliding with them and injuring the officers on several occasions.

CORNER OF MECHANIC AND CORTLAND STREETS, JACKSON, SHOWING HEIGHT OF TRAFFIC SIGNAL ABOVE STREET

The booths were later elevated on concrete foundations heavy enough to withstand the impact of an ordinary vehicle. This accomplished one purpose, but introduced another hazard. The increase in traffic demanded a greater degree of protection than could be afforded by the few officers available. The expense of additional officers to take care of all the fifteen dangerous intersections in the down-town district was found to be $27,000 a year, which was more than the city authorities could well undertake, and the manual system was not satisfactory in that its control was not uniform. Traffic would be clear at one intersection and congested at the next. The driver never knew how long the green light would be on, and the officer was often in doubt as to when to change the signal.

To remedy this condition an automatic signal system was installed and placed in operation March 15, 1925. This system covers the fifteen busy intersections of the downtown district, as shown in the accompanying map. The connections were made to move all the east-and-west traffic at the same time, alternating with the north-and-south traffic. In connection with the lights there is a gong which rings during the period of change while the amber light is on and a siren which gives the alarm in case of fire, warning traffic to clear the way for the fire department. There is also a manual control to replace the automatic flasher in case of a parade or similar condition. This system was installed by the Essco Manufacturing Company, of Peoria, Ill.

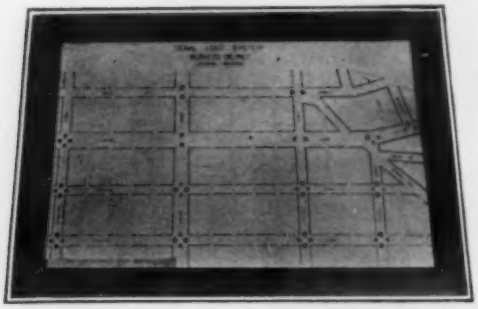
This new system handled the situation much better than the old method, but proved a great temptation to drivers to exceed the speed limit to make as many of the intersections as possible before change of signal. The timing of the east-and-west traffic was 35 seconds with the same interval on the north-and-south, and with 6 seconds on the amber light.

The problem was an object of concern to the authorities when the present officers of the Jackson Safety Council came in. Their attention was called to the situation, with the thought that something might be done to keep traffic moving and at the same time prevent violation of the speed limit, thereby promoting greater safety and a more economical use of the streets in the congested area.

Keeping Traffic Moving Continuously

An intensive study was made and a plan was worked out by which it was shown to be possible to keep traffic moving continuously through the protected area at the speed limit of 15 to 18 miles an hour. This plan provided for alternating the clearances in a given direction so that a driver starting at either end of the protected area with the green light could go straight through without stopping if he was careful to keep within the above limits. As will be seen by reference to the map, the east-and-west blocks are approximately twice

MICHIGAN AVENUE AND BLACKSTONE STREET, JACKSON, WHERE TWO VERY BUSY MAIN HIGHWAYS MEET AND TRAFFIC IS KEPT MOVING



MODEL WHICH WAS USED TO VISUALIZE THE CONTINUOUS TRAFFIC PLAN IN JACKSON

It consisted of a map of a section of the city mounted in a frame, back of which was a slider carrying with it the red and green lenses which appeared back of holes punched in the map. Light was furnished by an ample-sized lamp in the back of the frame. A little rule at the lower left-hand corner, laid out in seconds, made it possible to locate a car at any time along the map

the length of the north-and-south blocks. The same period of time is allowed to two north-and-south blocks as is allowed to one east-and-west block.

This plan was visualized by the use of an ingenious model which was displayed at one of the regular meetings of the Safety Council at which the City Commission and the Chief of Police were guests. After some discussion its adoption was recommended by unanimous vote, and the city authorities agreed to give it a thorough test.

The change was made by simply turning the necessary signal units at right angles without disturbing the control mechanism, except that the interval of the amber light has been changed to 3 seconds. The main signals are still on 35 seconds in both directions. The new system has been in use since January 10 of this year. It is accomplishing the desired results. Public approval is indicated by numerous letters received by the Safety Council from business men and other automobile drivers, and from Chief of Police Charles Phelps, who writes:

"Many visitors to the city have spoken about the elimination of waiting for lights to change. It also has a tendency to keep the driver's mind on the signals and certainly keeps traffic moving in a way that nothing else could do.

"In the past when this system was spoken of, I was told by different ones that it was very impractical. In fact, one of the directors of one of the largest automobile clubs of the country claimed it could not be worked.

"I have found it is far better than traffic officers, more efficient, and, of course, not so expensive. We now have fifteen of these signals, and I am so well pleased with the new system that the Jackson Safety Council proposed that next year, 1927, I hope the City Commission will supply us with ten more, as there are corners where they can be used to a great advantage."

This change we consider a step in advance in traffic regulation, in line with the progressive spirit of Jackson. It has been brought about by the close cooperation among the city authorities, the Chamber of Commerce, the Safety Council, and other public and semi-public agencies for civic betterment, and it is felt that by working out this change a real, constructive service has been rendered to the community.

EDITORIAL NOTE.—The plan which the city of Jackson has developed, as described in the foregoing article, is substantially the "No-Stop Traffic" plan the theory of which is outlined in the article by George T. Street, Jr., in THE AMERICAN CITY for April, 1926, pages 397 to 399. In commenting on Mr. Street's article (published since his own article was written) Mr. Stecker writes:

"This was exactly the idea which we had hoped to accomplish when we recommended the change of the signals to the city. We were aware, however, that it would not be 100 per cent non-stop for the reason that it is impossible to proceed down Michigan Avenue in either direction and turn off onto side streets without being held up for a short interval. East-and-west, and north-and-south traffic are absolutely non-stop if the speed limit is not exceeded."

Extent of Municipal Ownership in the United States

AN important feature of *The Municipal Index* for 1926 is a list of the utilities and services owned by the municipalities of the United States having, according to the 1920 Census, 5,000 population or more. Of the 1,481 municipalities covered by the inquiry, official replies were received from 1,358, and for 33 others information was secured from other sources.

A list of the utilities and services covered by the inquiry and the number of the municipalities reporting affirmatively in each case follows:

1. Water-works, 1,015.
2. Electric light plant, 337. (Of these 74 purchase the current, but own the distribution system.)
3. Gas plant, 41.
4. Street railway, 24.
5. Motor-bus line, 22.
6. Ice plant, 16.
7. Central heating plant, 13.
8. Coal storage or fuel yard, 19.
9. Harbor and terminal facilities, 89.
10. Abattoir, 34.
11. Market building, 137.
12. Public laundry, 18.
13. Airplane landing field, 62.
14. Public comfort station, 417.
15. Municipal garages, 193.
16. Central asphalt paving plant, 76.

For the complete list of cities and the municipally-owned utilities and services reported by each, the reader is referred to *The Municipal Index* for 1926, pages 95-101.

What Florida Can Teach and Learn

A Symposium on City Planning, Municipal Improvements and Real Estate Subdivisions

From John Nolen

City Planner, Cambridge, Mass.; President, National Conference on City Planning

Among the important lessons which municipal officials and city planners and realtors in other states can learn from the developments of the last two or three years in Florida, I would mention:

1. Nothing is gained by overcrowding. Florida is a large state. Every residential lot for a single-family house in a state like Florida should be from 60 feet to 75 feet in width. Generally speaking, there should be no residential lot for single houses less than 50 feet. This standard has been followed in many instances.

2. The importance of the traffic problem, both moving vehicles and parked vehicles, should be recognized. Furthermore, the solution of the traffic problem is to be sought not so much by wider streets as by proper general plan of the town providing for a skillful distribution of the organic parts, especially the objectives of the principal traffic routes.

3. Provision should be made in connection with the first layout of the land for adequate open spaces, sites for public buildings, etc. This should be done even though the owners of the land do not dedicate such properties for public use. In many subdivisions in Florida land has been set aside liberally for public use.

4. Store centers for local neighborhoods, well located and well designed, should be provided in residential districts. San Jose Estates, near Jacksonville, is a good example of a suburb in which this has been well done.

5. Planning should be accompanied by development, or definite legal provision for it. The best subdivisions in Florida have done this.

6. High land values tend to low standards of street widths, smaller percentages of open spaces, greater density of population, and more difficulty and cost in replanning developed areas, or in extending new planning into undeveloped areas. The principle of special local assessment should be more frequently applied.

The most important suggestions from the city planning point of view for Florida that I have to offer are as follows:

1. Florida and all other states should have the advantages and benefits of sound, statewide city planning and zoning legislation.

2. Florida, even more than other states, would profit right now from a state plan, a plan conceived in the broad spirit of Warren H. Manning's National Plan, or of the state plan prepared by the Commission of Housing and Regional Planning for the State of New York.

3. Every town and city in Florida should have a suitable, well-supported local city planning office as a part of its city government.

4. Real estate and other business interests and the city planning commissions should be working together on common problems. This is being done in many places.

5. The cities of Florida, its counties, and Florida as a whole, should strive more and more for characteristic development, especially those sections hoping and expecting to develop as permanent resorts. Florida is an example in this respect as compared with other states. In some places the town planning lags behind the architecture.

6. Next to soil and climate, Florida's greatest attraction and resource is its water-front. Everything that can be done should be done to regain public ownership and control of the water-front.

7. Florida's agriculture should have first attention, even before tourist development. Upon the development of agriculture rests the prosperity of the state. The leaders ap-

Answers to Two Questions

As announced in the May number, the holding in Florida of the National Conference on City Planning has resulted in the suggestion that The American City could render an important service to the municipalities of Florida, and to other rapidly growing communities throughout the United States, by publishing a symposium in which the city planners who have recently visited Florida would answer these two questions:

1. What is the most important lesson which municipal officials, city planners, or realtors in other states can learn from the developments of the last two years in Florida?

2. What is the most valuable suggestion which you can offer to the leaders in municipal and civic affairs in Florida as a result of what you have observed and learned on your recent trip?

Letters for this symposium will be welcome from all who have constructive suggestions to offer. Seven such communications are here published. Others will appear in the July number.

preciate this fact.

8. Florida cannot be too democratic. Efforts should be made to attract all sorts of desirable citizens and not merely the wealthy. Provision should be made in cities and in the country for all classes, especially for labor. The Venice, Florida, development of the Brotherhood of Locomotive Engineers, is one of the best from this point of view.

From Edward M. Bassett

Counsel, Zoning Committee of New York, Vice-President, National Conference on City Planning

Landscape work and private restrictions have been the specialties of Florida thus far. The planning of municipalities has not been fundamental. State laws should be passed permitting all municipalities to adopt sound zoning ordinances and establish boards of appeal, also to prevent misplaced streets and to prevent the issue of building permits on such streets.

Communities in older states have allowed congested four corners to grow up at the point where the main highway of the district bisects the city. Florida can hardly be blamed for following this mistaken method. City centers should be a short distance away from the great highways and not on them. There is still a great opportunity for Florida to avoid the mistakes of other states in this respect. Already traffic on the Dixie Highway is slowed down by street congestion in cities of all sizes. Sooner or later there will be a demand to by-pass these cities, thus destroying what is now a direct thoroughfare.

The land of the state cannot be organized under private restrictions. These are good so far as they go, but they are temporary at the best and sooner or later invite invasions. There is danger that, as the best developments build up with high-class residences, the outskirts of such developments will attract injurious structures. This can be avoided only by comprehensive zoning.

Many municipalities have not yet established a control over building permits.

Elimination of railroad grade crossings should be insisted upon in important centers of population. When these cities are more densely built up, these grade-crossing eliminations become exceedingly expensive.

From Harland Bartholomew

City Plan and Landscape Engineer, St. Louis

1. The most significant lesson to be learned from the last two or three years of development in Florida is the present expressed attitude of a majority of the Board of Directors of the Florida State Real Estate Association for a law prohibiting subdivision of land without simultaneous provision of all improvements, thereby actually fitting the land for use. Already a large number of American cities make such a requirement, and as time goes on all intelligent municipal authorities will demand such improvements coincident with the platting and selling of the land. Of course, this implies that an owner of land who intends to subdivide and sell to actual users of land must likewise study the best use of his property from the standpoint of marketability and likewise study construction costs, which in turn leads to the fundamental economies to be obtained through proper planning.

2. It is just as easy to grow right as to grow wrong—and it is much cheaper. A comprehensive city plan prepared at as early a date as possible in the city's history is a benefit rather than a detriment to growth. In periods of rapid development vast opportunities for accomplishment of the city plan follow naturally. If advantage is taken of these opportunities, when the city subsequently settles down into a period of stable growth, there is not the vast number of mistakes to be corrected and expensive improvements to be reconstructed.

From Charles Wellford Leavitt

Civil and Landscape Engineering and City Planning, New York

1. After observation of Florida in a general way for twelve years past, and intimately for the past two years, I feel that all those out of the state of Florida can take to heart and properly follow the lead of Florida people in the way in which they have set about providing cities with up-to-date drainage; water-supply; electric and other conveniences; large and well-equipped schools set in lots of ample size; construction of hard-surfaced streets and roads, well policed and provided at congested points with traffic regulation; regulation for proper additions to the cities by control of subdivisions; providing for arteries of travel; up-to-date tourist camps to help those without homes, and the erection of hotels suitable for both tourist and commercial travelers; bus transportation of a superior order; and providing space for the many commercial and industrial plants now seeking Florida locations. Those who have been in authority in Florida cities have met this emergency in a most energetic and masterful way.

On the other hand, we may also learn how sadly certain cities of the state failed in permitting many of the orange groves and other valuable trees to be sacrificed to over-anxious

land speculators; permitting reclamation of under-water lands for lot sales rather than agricultural pursuits; the unrestricted sale of land for habitation without requiring drainage, water-supply, and street pavements (this latter being largely responsible for the present setback in realty values).

2. For the city officials in Florida who have been progressive, I have little to add. To the others, I would suggest that they follow the lead of such progressive cities as Lakeland, West Palm Beach, Arcadia, St. Petersburg, Winter Park, Sarasota, and Orlando, which are rapidly working towards a state of civic perfection.

All cities in Florida, including the above, are suffering from a lack of good, fresh food, and the officials should take immediate steps to perfect dairies, truck gardens, and citrus groves that will cater to the wants of their own citizens (not to New York and Chicago markets), and encourage restaurants where such food will be well cooked and served palatably. Supplying good, nourishing food is most essential for the future health of Florida people. Heretofore food has been scarce, expensive, and badly cooked and served.

Encourage all industries, no matter how small; restrict the heights of all buildings to ten stories; create municipal art juries that will not only control all municipal structures, but influence against freak buildings by individuals; secure new lands for playgrounds, parks, parkways and reservations for camping, fishing, and game preserves; protect cities against subdivisions with narrow streets, small lots, and lacking the necessary improvements and attractive appearance; improve the appearance of the cities by making the entrances by rail, bus, and water attractive, and prevent the accumulation of debris, garbage, and noxious weeds; and provide parking spaces for autos near shopping districts.

Without good healthy food, Florida children will be severely handicapped; without cleanly, well-patrolled cities and pleasant-appearing homes with good service both within and without, the members of the coming generation will not be able to compete with those in older and refined city environments. Let Florida at least keep pace with the best.

From Frank B. Williams

Author of "The Law of City Planning and Zoning," New York

My most vivid impression of Florida was obtained before I visited her, from a study of her statutes; and that impression was confirmed by what I saw while there.

The great need of Florida is intelligent planning, of which zoning is an essential part. Florida, with her limitless resources, has energy in abundance to develop them; all that she requires is the proper guidance of that energy, and her future is assured.

The foundation of control is law. Florida has a multitude of zoning laws, some showing study of sound models, but all limited in their application to special localities. The result is confusion which will lead to adverse court decisions and the overthrow of zoning in Florida, as it has elsewhere.

The most valuable suggestion I can make to Florida, therefore, is that she pass a law based upon the Standard Act prepared by the Department of Commerce at Washington, D. C., and repealing all special legislation, which will authorize all communities within her borders to pass zoning ordinances. The courts of Florida have already shown that they will support such a law.* It only remains for the people of Florida to pass it.

From Charles F. Mebus

Civil Engineer, Philadelphia

I do not see that the city planning problem in Florida differs much from that of planning around the big cities in other states. In Florida, of course, much of the development is for winter residents, but a great deal is natural expansion of substantial cities and towns. Much of the planning done is very good, and there is more that is not so good.

The lesson to be learned, I believe, is that municipal officials and planning commissions should have ample authority and means to plan in advance of possible developments, so that street systems may be provided to meet modern conditions of travel and transport, so that business, industry, and trades may be properly located for the convenience and well-being of the community, and proper reservations made in advance for school sites, playgrounds, parks, and boulevards.

Above all, I think that the city plan, or additions to such plan, should be so made that it may be economically operated and maintained. A plan may easily be made so elaborate or impractical that it will be burdensome to maintain on the scale on which it was first planned. Again, a plan may be but partially worked out, street grading, drainage, etc., not being considered, and the lots sold without the in-

* State ex rel. Shad v. Fowler, 105 Southern Reporter 733.

stallation of utilities. Under such conditions the future community will most likely be hard-put to find the necessary capital to properly complete the development and to make it really livable.

Subdivisions can rarely be satisfactorily made of a single property, and therefore I say planning commissions should have ample authority and means to plan far ahead, regardless of individual property holdings.

Realtors should give greater consideration to the comfort, well-being, and happiness of those who will live on the development twenty-five to fifty years hence, instead of planning simply for the purpose of making immediate sales at the utmost profit, as is so often done. There is too much thought given to "window dressing" and promotion schemes, and not enough to the substantial things that make a development a place in which to locate a home and live comfortably and happily. This is especially so where developments are made beyond the limits of municipal planning control.

From S. Herbert Hare

Landscape Architect and City Planner, Kansas City, Mo.

Florida is an interesting study to municipal officials, city planners and real estate operators. There they can see some creditable examples of municipal and real estate development and many examples of what not to do.

Nothing has happened in Florida but what can or does happen in any state or city in the country. It has simply happened more quickly. Every city which is growing is extending its streets, platting subdivisions, extending utilities, seeking places for schools and other public buildings and is, or should be, providing for recreation. If a comprehensive plan has been prepared and the necessary legislation enacted, such developments can be done in an orderly, systematic way so that replanning in the future will not be necessary. The rate of development does not greatly affect the results if the proper control can be exercised. But without this control, accelerated or boom development with its speculative values produces a chaotic physical condition, prohibitive costs, and scattering ownerships, which makes replanning practically impossible for the average community.

Florida furnishes to the real estate man some fine contrasting examples of the value of control of architecture in a development. It has in close proximity some examples of the very best and the very worst in domestic architecture. Many of the outstanding developments owe as much of their success to the quality of architecture as to the street plan.

Another point which can be profitably studied by other cities is the treatment of the water-fronts. Most of the coast cities either have developed or are developing well-planned water-front parks which do not interfere with the commercial water-front.

Many of the cities are now occupied with the preparation of plans. Those cities, both large and small, which have not such plans should be busily at work taking advantage of opportunities before more permanent structures are built. In addition to the city plans, there is great need for regional planning in several sections. This work can be carried on by voluntary committees, private capital, or popular subscription until the necessary legislation is enacted to make it official.

Old-fashioned Town Meeting Held in City of 400,000 Population

CINCINNATI, OHIO.—The old New England Town Meeting, which is considered by many as the only real example of a pure democracy in the American political system, was given a trial on April 9 by the Cincinnati Charter Committee. Not satisfied merely with getting rid of the old-time politicians and substituting for the large council of thirty-two, a small council of nine with a city manager, the Charter Committee took the voters into its confidence and invited all to attend this public meeting to discuss the welfare of the city.

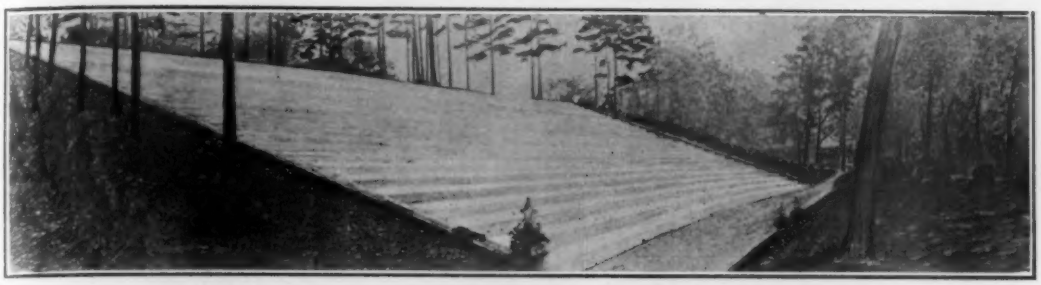
Notices of the meeting were sent to all contributors to the City Charter Committee, to all members of the local improvement associations, and through the press to all other voters, asking them to submit questions in advance of the meeting that would be answered by the City Manager and other officials of the city government.

The meeting was held in the auditorium of Woodward High School, which was selected on account of its central location. All the members of the Council were present. Before proceeding to the questions, City Manager Sherrill gave a brief resume of the changes that have been inaugurated at the City Hall. By far the greater number of questions were submitted by the Federated Civics Association, which is composed of three delegates from each of the fifty-four local improvement associations.

The most numerous questions were regarding the quality and tests of gas. The next larger number related to street repairs and construction and was followed by questions regarding the finances of the city.

Henry Bentley, the President of the City Charter Committee, presided and propounded the questions, which were satisfactorily answered by City Manager Sherrill and other members of the Council.

A. G. WULFF.



RANKIN MEMORIAL GARDEN THEATER, WOONSOCKET, R. I.

Woonsocket Plans Park System and Erects Garden Theater

By Arthur Leland
Landscape Architect

WOONSOCKET has made an auspicious start in the remodeling of its four parks into an exceptionally picturesque and practical park and recreation system. These tracts, which were acquired some years ago at a small fraction of their present value, are well located and have great natural assets. In recent years, however, no improvements have been attempted, there being insufficient funds available even for adequate maintenance.

In crystallizing public opinion on recreation needs in Woonsocket and in developing the program of park improvements which is now going forward under the efficient direction of Park Superintendent Eugene M. Weeden, the Park Commission received valuable assistance from a representative of the Playground and Recreation Association of America, and also from Mrs. William F. Barry, a former member of the Commission.

The first important accomplishment in this program has been the erection of the Rankin Memorial Garden Theater at Cold Spring Park, for which the writer was retained as landscape architect. This project was made possible largely through a bequest of $5,000 by A. B. Rankin to be used as a memorial.

The theater is built on a side hill of about 30 degrees slope, so that an unobstructed view of the stage can be had from every seat. It has a seating capacity of 2,500, and as many as 1,000 can appear on the stage at one time. What is believed to be an entirely new principle of construction was used in its erection. Each seat is merely a terrace on the side of the hill, held in place by a reinforced concrete retaining wall cast in the shape of a "T." These retaining walls were cast with movable forms, so that it was necessary to make only enough forms to construct one row of seats across the width of the theater. This one set of forms was used for one row after another, thus saving considerable expense for carpentry labor and material. Two tiers of seats were first constructed and allowed to winter in order to ascertain the action of the elements on this new form of construction. The experiment proved a success and the work proceeded.

THE THEATER HAS A BEAUTIFUL SETTING IN A PINE GROVE

The ends of the seats are jointed together with a reinforced concrete stringer surmounted by a rail, over which vines will trail.

The four corners of the theater end in concrete piers, on which flower pots filled with bedding plants will be mounted. The front of the stage has a field-stone retaining wall. This will be covered with ivy and climbing vines. The stage is finished with a turf surface, and privet and hemlock hedges outline the wings and act as screens for dressing-rooms. The theater is surrounded by a grove of fine old oaks and pines, which contribute a great deal toward the excellent acoustics.

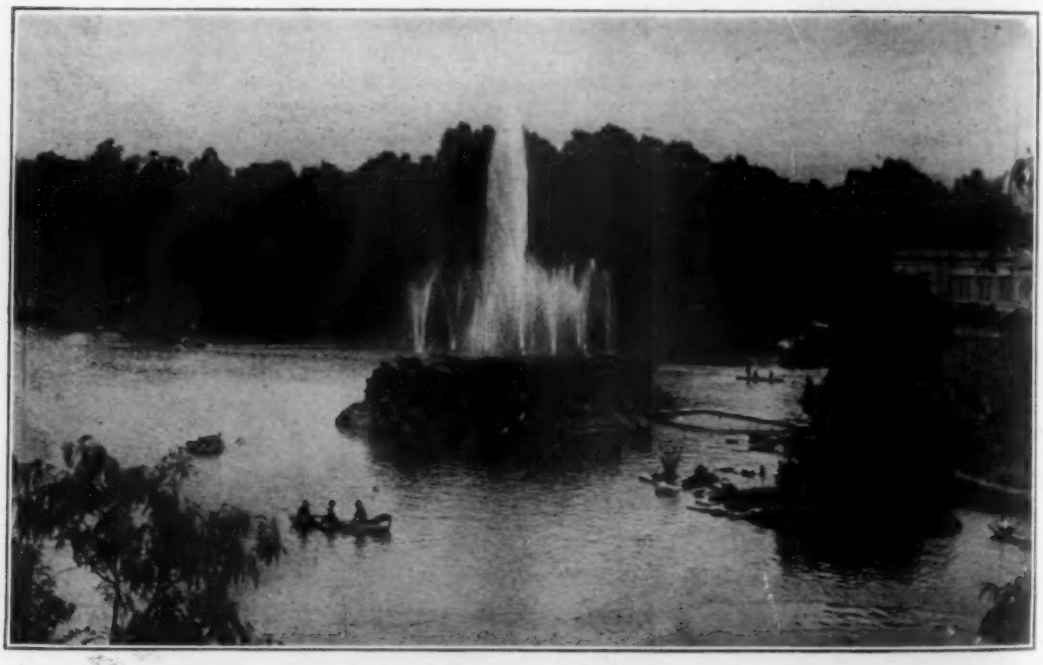
The complete cost of the concreting amounted to about $5,000; the grading, about $2,000; and the planting, landscaping, and finishing of the stage, approximately $3,000, making the total cost about $10,000.

It had been hoped originally to finish the seating surfaces of the terraced steps with a turf, which when closely cropped would give an artistic park-like effect to the whole structure. The fact that the theater was built on a gravel bank, however, made it impossible to raise a good stand of grass, so that it was deemed wiser to apply a top dressing of bright-colored torpedo sand, rolled and packed. This will materially reduce maintenance costs. Spectators will sit on woven Japanese grass mats, which will be rented for a nominal sum, and the revenue thus derived will assist in financing entertainments.

The garden theater will not compete in any way with the other theaters of the community. It will be used mainly for community celebrations, and motion pictures will not be a part of the programs.

Fountains of Don Quixote and the Bullfrogs Reproduced for Mexico City

TO those seeking rest and quiet in Chapultepec Forest, Mexico City's beautiful park, the Fuente del Quijote (Fountain of Quixote) offers not only a place to sit but books to read. Four tiled seats, shaded by ancient trees, surround the gracefully modeled fountain. On two sides are small statues one of Don Quixote and the other of Sancho Panza. The bases of the statues are the bookshelves, where one may find not only copies



ONE OF THE PLEASING FOUNTAINS IN CHAPULTEPEC FOREST, MEXICO CITY

THE FOUNTAIN OF QUIJOTE, IN CHAPULTEPEC FOREST, MEXICO CITY

of Cervantes' masterpiece, "Don Quixote," but also works of other masters in poetry, history, fiction, and philosophy.

The entire fountain is a replica of one in the Maria Luisa Park of Seville, Spain. Senor Miguel Alessio Robels, former Mexican Ambassador to Spain, was responsible for the copying of this work of art and for its transplantation to Mexico two years ago. The greater part of the fountain was made in Spain, some of the tiles being completed in Puebla, Mexico. A pictorial summary of scenes from "Don Quixote" is found in the seats, depicted in a series of 180 majolica tiles. In the tiled floor around the basin are the words of the first line of the book, and a message from Seville to the Mexican city in which Seville expresses pride in the part it played in the conception of the masterpiece and extends the hope that the fountain may be "a monument erected in two worlds for the enlightenment of all men."

The Fountain of the Bullfrogs, which stands at the entrance to Chapultepec Forest, was also brought from Seville by Senor Robles. This is a circular basin of sparkling tiles, with eight green and yellow bullfrogs squatting on the rim, spouting graceful streams of water that meet in the center of the basin over a ninth stream projected from the beak of a white swan on the back of a brown turtle.

—From the Bulletin of the Pan American Union.

How Automobile License Fees and Gasoline Taxes Are Distributed

ACCORDING to a tabulation prepared by *American Highways*, the gross receipts from automobile license fees in the 48 states during the year 1925 were $260,328,414. The distribution of these fees in dollars and percentage was as follows:

For state roads and bonds—$196,576,214—75.5 per cent.
For local roads—$48,396,471—18.6 per cent.
Collection and administration—$11,955,927—4.6 per cent.
Other purposes—$3,399,802—1.3 per cent.

Gasoline taxes during the year 1925 brought total receipts of $145,933,990, distributed as follows:

State roads—$99,481,284—68.2 per cent.
Local roads—$37,039,023—25.4 per cent.
Collection and administration—$210,623—0.1 per cent.
Other purposes—$9,203,060—6.3 per cent.

On April 1, 1926, gasoline taxes were in effect in 44 out of 48 states, the tax ranging from 1 cent to 5 cents per gallon. In four states the rate is 1 cent per gallon; in nineteen states 2 cents; in one state 2½ cents; in ten states 3 cents; in three states 3½ cents; in four states 4 cents; in one state 4½ cents; and in two states 5 cents per gallon. The four states having no gasoline tax are Illinois, Massachusetts, New Jersey and New York.

Traffic Congestion, Parking Facilities, and Retail Business

A Study by the Bureau of Foreign and Domestic Commerce of Expressions of Opinion from Representative Merchants in More Than 800 Cities and Towns

THE present survey is based upon more than 1,500 expressions of opinion from representative merchants having direct contact with the traffic problem in communities of different size throughout the country. Most of these merchants have reported that their business is interfered with because of traffic conditions. The extent to which this interference exists indicates that it varies from 1 to 20 per cent.

The Problem as the Retailer Sees It

Recognizing the fact that there is no group of persons more concerned in the problem of traffic congestion than retail business men, the Domestic Commerce Division of the U. S. Bureau of Foreign and Domestic Commerce has secured data and expressions of opinion on the subject from merchants in communities both large and small in all parts of the United States. The results are published in a 52-page pamphlet on "Vehicular Traffic Congestion and Retail Business," dated April, 1926, excerpts from which comprise the accompanying article. Copies of the pamphlet are obtainable from the U. S. Department of Commerce, at Washington, D. C.

Causes of Vehicular Traffic Congestion

Summarizing the reported causes of vehicular traffic congestion, this survey showed that merchants generally consider faulty traffic regulations in the form of unenforced, misfitted, and insufficient regulations, with the greatest emphasis placed on unenforced regulations, to be the dominant cause in all cities throughout the country, and a cause varying only in proportion to the size of the city. Lack of parking facilities was given as the next greatest cause producing congestion, a cause not only varying in proportion to the size of the city, but also with slightly different interpretations. Narrow streets ranked third as a cause, existing chiefly in all but our largest cities. Where cities have grown, various remedial measures, such as widening streets or establishing the one-way traffic regulation, have been made use of to overcome this cause as a producer of congestion. Street cars as a cause was reported in numbers proportionate to the size of the city. In connection with street cars as a factor, the real cause is a multiplicity of causes, and no one vehicle or means of transportation can be cited as the sole factor. While all these elements which have been reported as producing congestion have their own relative weights in the respective cities, the fact remains that they are considered quite as real and proportionately as serious in the smaller communities as in our metropolitan centers.

Attention is called to the fact that there has been no attempt to analyze the cause factors referred to as actual causes of vehicular traffic congestion. What is given here is merely explanatory of the causes, and accompanying comments as reported in this survey. These causes are believed to be of value, however, as part of the merchant's viewpoint on traffic in his own business district.

The Effects of Congestion on Retail Business

If vehicular traffic congestion leaves marks of danger, loss of time, inconvenience, and anxiety on the buying public, what of the marks made on business itself?

DIVERTED BUSINESS

Necessary business which cannot be satisfactorily transacted at one location will find a location where it can be transacted. It is natural for store patronage to follow the line of least resistance. Just how much business is diverted for this reason is not known, but it is reported to be on the increase. All cities which are decentralizing have one or more busy, thriving, and alert subcenter business districts. More than one merchant has reported, "They go where they can park." But lack of parking facilities is only one part of the whole problem of traffic that is to be battled with on congested streets and that forces people to shop where shopping is less complicated.

The subcenter shopping district no longer consists of only the corner grocery, a drug store, and a delicatessen. It includes stores

representing all kinds of merchandise and usually a bank. In our largest cities, the subcenter is a complete shopping district differing from the downtown district only in size and magnitude of establishments. The downtown merchants are asking themselves these questions:

If wants can be satisfied at such locations, where congestion is less, is it not natural that trade will be diverted to these locations?

If parking facilities are ample, if there is less street traffic to cause loss of time, inconvenience, and anxiety to shoppers, is it not logical to assume that such trade may increasingly prefer to shop in subcenter locations?

In some few of our largest cities downtown merchants have sensed the situation and are establishing branch stores in subcenters. In one city a subcenter shopping district has been deliberately planned. It was found that the greatest buying power of that city was in a certain residential section. In order to capitalize this, it was decided to locate a "bonton" subcenter shopping district on the edge of this residential section. Two of the city's largest department stores have already bought sites there for the location of branch stores. In this way old and well-established business houses which have spent years in building up good patronage are striving to maintain trade which they apprehend may gravitate permanently to subcenter districts with ample parking facilities.

The thought has been expressed by traffic authorities and city planners that even if business is diverted to a series of subcenters, it is possible that the downtown condition of congestion may repeat itself in these new business districts. This idea is substantiated by a chart [to appear in THE AMERICAN CITY for July] based on the present questionnaire survey, which indicated interference to business in subcenter shopping districts to no small degree. It would seem that unless definite measures are employed to remedy the situation, such interference will undoubtedly increase. So where there is a need for subcenter shopping districts as a present relief to the traffic problem, it should be noted that they alone are not sufficient to afford a solution.

If that retail business which cannot be accommodated in our decentralizing cities is being diverted to each city's subcenter shopping districts, what of that business in our centralizing cities and small communities? The chart also gives us an idea of the reported amount of customer patronage that shop in these places with the use of an automobile and that must be accommodated somewhere in the present scheme of street traffic. These cities and communities do not have the problem of trade diverted within their own limits. Rather, they have the problem of trade diverted to neighboring cities and communities. The present questionnaire survey indicates that no small proportion of the trade of one community finds its way by means of the automobile to the next largest community or city, and so on until this chain of diverted trade reaches the metropolis, where vehicular traffic congestion is so great that the owner-driven automobile is seldom used for shopping purposes, and entrance to the city is made in most cases by means of train or bus.

It appears, therefore, that both the merchant of the decentralizing city and the merchant of the centralizing city have the problem of diverted trade. In the former case it has spread out within the city's limits; in the latter, it has left the city for the next largest community.

Questionnaire Distribution and Returns

A total of 7,621 questionnaires was mailed to merchants representing the following lines of merchandise: dry goods, men's and women's clothing, hardware, furniture, jewelry, shoes, groceries, and drugs.

On the date set for the return of all questionnaires there had been received 1,426 good, usable replies or more than 18 per cent response. Subsequent to the date upon which all questionnaires were due, 104 others were received, making a total return of 1,530 questionnaires or more than 20 per cent. It is regretted that the last 100 questionnaires received did not come in early enough to be included in the tabulations. However, the comments which they contained were not too late to be of use and proved to be of considerable value.

Classification of the Tabulated Replies Into Four Population Groups	Tabulated Questionnaire Returns in Each Group	Cities Represented in the Tabulated Returns
Group 1: Cities of over 200,000 in population ..... Down-town 228; subcenter, 140.	368	33
Group II: Cities between 50,000 and 200,000 in population ..... Down-town, 194; subcenter, 30.	224	78
Group III: Cities between 10,000 and 50,000 in population	292	219
Group IV: Incorporated places from 2,500 to 10,000 in population	542	511

INCREASED COST OF MERCHANDISE

While the chief interest of retail business is to sell merchandise with satisfaction to its patrons, other interests of direct or indirect relation are given attention. The successful merchant keeps a watchful eye on all those factors which tend to increase the cost of merchandise.

Much has been said about delays in the delivery of merchandise, both bought and sold, which occur regularly as a result of vehicular traffic congestion, occasioning an additional buying expense and increased selling cost. According to the reports of the National Conference on Street and Highway Safety, detailed traffic tallies in a city of more than 175,000 in population indicated that congestion was costing that community $35,000 a day. In another city of something more than twice that size, estimates were that congestion costs $100,000 a day, while in and about one of the largest cities in the country, delays in the operation of a fleet of 843 taxicabs due to congestion amounted to 9.5 per cent of the working time of the cabs, or the equivalent of about $2.50 per day per vehicle. And this is time lost as a result of congestion only, and does not take into consideration time lost as a result of turns, poor name signs, badly marked and maintained detours, and a number of other delay causes.

EFFECT OF CONGESTION ON FIRE FIGHTING

Another cause of delay traceable to vehicular traffic congestion was acutely demonstrated in an extensive fire which occurred recently in a business area. Because of the congestion in that area it was difficult for fire apparatus to approach quickly, and considerable of a menace to merchants was thereby created. Delays as a result of all forms of congested traffic have been estimated to amount to an annual cost running into millions of dollars. With such a sum it is possible that retail business bears a goodly portion of this burden which sooner or later may find expression in the increased cost price and the increased selling price of most merchandise.

Shopping Periods and Parking Regulations

Perhaps there is no phase of the traffic problem more mooted than the subject of parking. Engineers, architects, traffic experts, and police authorities, as well as merchants, have all expressed themselves on this point at length and with diverse opinions.

Streets are public property—not to be abused, but to be used with convenience for the good of the greatest number. The automobile has been a boon to humanity. Shall we ostracize it from business streets or fill business streets with so many of them that life, business, and property are in danger? Either of these methods of approach, in seeking a solution to the traffic problem, has been commented upon by traffic authorities as an invitation to the disintegration of business districts. Undoubtedly, some arrangement will be devised whereby automobiles may serve their greatest use in all areas without conflict either with each other or with other street traffic.

A few moments may be sufficient for the automobile which stops at the store entrance to discharge potential customers. But for the automobile which waits without a driver while its occupants make their purchases, reported opinion is that either the stop of a reasonable shopping period should be allowed or else no period at all.

Conditions in but few cities are said to have reached the point where the "no parking" regulation is necessary in retail areas. But where such a regulation is deemed advisable because of extraordinary traffic congestion, the narrowness of the street, a steep grade, or some physical condition of the street, it is commonly granted by merchants that it is wisdom to employ it. In the vast majority of cities, however, parking is permitted on business streets. The length of time of the parking privilege appears to be the debatable point.

EDITORIAL NOTE.—Further quotations from this important report will be published in the July number. These will include sections headed "Length of Shopping Periods," "Length of Parking Privileges in Effect," "Relief Measures in Use for the Merchant's 'Front Door'," "Relief Measures in Use for the Merchant's 'Back Door'," and "Parking Facilities Offered by Municipalities."

NEARLY 74 PER CENT ARE CHAMBERS OF COMMERCE

The extent to which "Chamber of Commerce" has become standardized as the name of the leading civic-commercial organization in American cities is indicated by the list of such organizations published in "The Municipal Index" for 1926. The list covers all municipalities in the United States having 5,000 population or more, according to the 1920 census. Of the 1,376 organizations listed, 1,016 have the name Chamber of Commerce. This is nearly 74 per cent of the total. Other names used by ten or more of these organizations are: Board of Trade, 87; Commercial Club, 49; Business Men's Association, 48; Association of Commerce, 32; Board of Commerce, 17; and Merchants' Association, 13.

THE BUILDING AS IT WILL APPEAR WHEN FINALLY COMPLETED

Teaneck Plans Town Hall as Unit for Complete Municipal Building

By William O. Ludlow
Architect

IN planning for its new town hall to be constructed this year, the township of Teaneck, N. J., has shown commendable forethought in having this structure designed as the center wing of a larger municipal building to be completed at some future time.

The town hall, which has been conceived by the architects, Ludlow & Peabody, in the early colonial style of architecture, to be carried out in red brick with limestone and terra-cotta trimmings, will stand on a seven-acre site against an attractive background of the

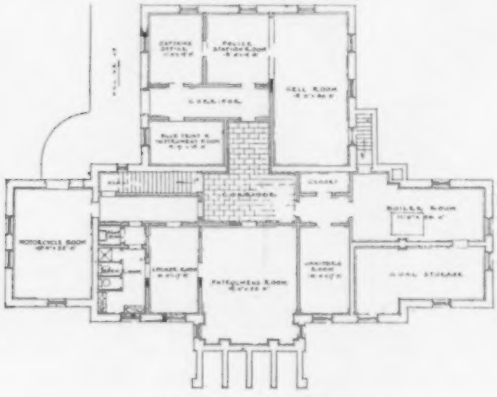
LOCATION OF THE TOWN HALL IN RELATION TO TEANECK'S CIVIC CENTER

ARCHITECT'S SKETCH OF THE PORTION OF THE BUILDING NOW UNDER CONSTRUCTION

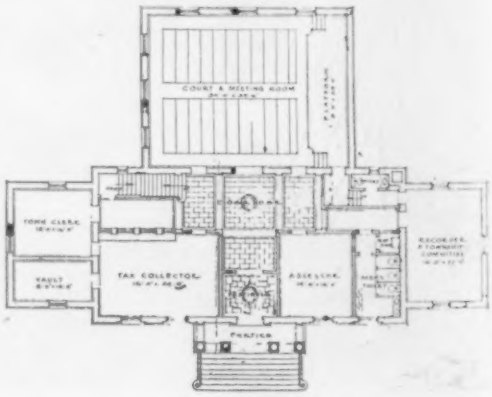
mature trees with which the plot is now well planted. As may be seen from the plot plan reproduced herewith, the town hall will be located on the central axis of the property, dominating the additional buildings which it is hoped will some day be erected on the site in the development of a real civic center.

Opening from the main entrance hall on the first floor of the building will be the court or meeting room, with a platform 10 x 20 feet and a seating capacity of about 150 people; the office of the recorder and Township Committee, from which direct access may be had to the platform end of the court room; the offices of the tax collector, the assessor, and the town clerk; and a storage vault.

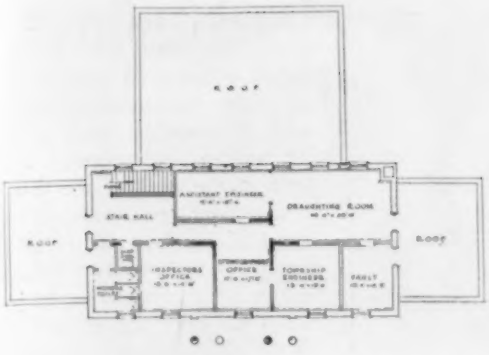
A marble staircase will lead from the entrance hall to the second floor, on which will be located the headquarters of the Department of Public Works, comprising a stenographers' room, through which the public must pass to reach the other offices of the Department; the office of the township engineer; the assistant engineer's office, separated by a glazed wood partition from the drafting room and a map vault. Adequate lighting in the



PLAN OF BASEMENT



PLAN OF FIRST FLOOR



PLAN OF SECOND FLOOR

drafting room is assured by the provision of skylights in addition to windows. The inspector's office is also located on this floor.

The basement of the building will accommodate the Police Department, in addition to the necessary boiler-room and coal storage space, a janitor's room, and a blueprint and instrument room for the Department of Public Works. The quarters of the Police Department will consist of the captain's office, fitted with a desk, filing cabinets, and a small safe; an adjoining police station room large enough to accommodate a desk and seats for patrolmen; a cell-room with four cells so situated that it will be entirely under the visual control of the officer on duty in the station room; a patrolmen's room for men off duty, fitted with a table, chairs, and a cot for an officer who sleeps in the Department; a locker-room with accommodations for fourteen lockers; a wash-room equipped with two lavatories, two urinals, two water-closets, and one shower; and a motorcycle room to house eight motorcycles. Public lavatories for men and for women are located on the first and second floors of the building respectively. The cost of this first building, including the cell equipment, etc., is $88,000.

To give an interesting grouping of the buildings, the three units take the contour of one side of the ellipse which is formed by the approach roadways and landscaped lawn. Most of the existing driveways on the property have been retained. At the present time they will provide excellent routes for the motorcycle police to and from the town hall, and with some slight changes they can be used in future as service drives for additional buildings. Should a fire house be erected as indicated on the plot plan, these roads may be developed in such a way as to eliminate the necessity of backing the fire apparatus either into or out of the fire house.

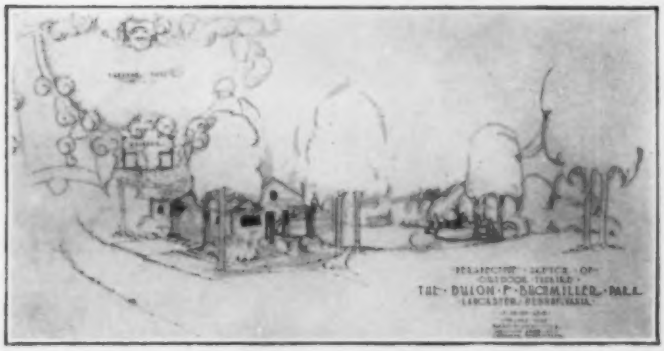
Development of 70-Acre Recreation Tract Bequeathed to Lancaster

By Harry B. Hostetter
Landscape Architect

THROUGH a bequest of the late Dulon F. Buchmiller, a local manufacturer, the city of Lancaster, Pa., has received a 70-acre tract of land for recreational purposes, with a trust fund of $100,000, the interest from which is to be devoted to the development and maintenance of the park.

In the general layout of the new park, which has been named for its donor, the first aim of the landscape architect was to develop a design that would satisfactorily combine the needs of those seeking rest and seclusion and of those interested mainly in modern sports. The northern portion of the property, as may be seen from the plan reproduced herewith, was chosen as most suited for such games as baseball, football, and soccer. The grades in that section are such that the land can be prepared for this purpose with comparatively little work. The southern part of the park, being the farthest removed from the noise and dirt of the city, seemed best adapted to a more general type of development, and here will be found wide expanses of lawn with many shade trees.

Automobile driveways, with sweeping curves, have been so located as to afford the easiest and safest grades. They will be constructed with bituminous macadam surfacing, and will have a width of twenty feet, except at certain points on curves and at parking spots where greater width is necessary. Rough grading on some of these roads has already been completed. Footpaths will lead to and connect all units in the park, and it is hoped to include a bridle-path.



Of the recreational features, the outdoor theater seems to offer possibilities of the greatest interest and practical merit. The site selected is ideal. The conformation of the ground is such that little grading will be required, and a natural background for the stage already exists in the form of two fine old beeches. The stage will be simply a flat sodded area supported at the rear by a retaining wall of stone. The wings will be of evergreens which can be clipped and retained in compact form, and at each side of the stage, hidden in masses of shrubbery, will be dressing-rooms made of canvas screens.

Space has been allotted for fourteen tennis courts, although not more than four are being constructed at the present time, these being considered ample to meet the needs of the community for the next few years. The remaning tennis area will be devoted to lawns for the time being. A secluded area, adjoining a large stone house now standing which will be used as a community building, has been selected for a children's playground. For this such equipment as swings, slides, etc., will be installed and a wading pool constructed. Two areas have been set aside for picnickers, these spots being selected because of their outlook over the surrounding country, ease of drainage, and proximity to the shelter-house to be built at the rear of the theater.

Excellent specimens of oaks, beeches, maples, and other native trees were already flourishing in some sections of the park when the land was turned over to the city. Since then several hundred new trees have been planted and a small nursery with a few thousand deciduous and evergreen trees has been started.

The matter of water-supply for the grounds is of course an important consideration. The first need is for a tank, so that water can be furnished to various parts of the park by gravity. This can in time be transformed into an attractive water-tower, in which one floor could be utilized for an aquarium. An aviary and a small zoological unit adjoining the water-tower are included in the plan.

Because of the present contamination of Conestoga Creek, which skirts the western frontage of the park, this water cannot now be used for bathing purposes, but with the installation of a sewage disposal plant for the city of Lancaster—which it is believed will soon be found necessary—this additional recreational feature will be properly developed.

Many details of the improvements outlined in the plan will not be completed for some time, but considerable progress has already been made, and the work will continue to go forward as rapidly as circumstances permit.

Important New Powers in Street and Park Planning

Two Enactments in New York State of Great Significance to City and Regional Planning Progress in America

UNDER Chapters 690 and 719 of the laws of New York State, adopted by the 1926 Legislature and approved last month by Governor Smith, every city and village in the state is now empowered to adopt a sound method of establishing streets and parks before condemnation. These new laws also furnish a constitutional procedure for maintaining the integrity of mapped streets for preventing misplaced streets and chaotic street layouts, and for preventing structures on misplaced streets where such structures would otherwise later need to be condemned for the purpose of putting through streets authoritatively established. Provision is also made for the setting aside of playgrounds in certain cases before the land is built on.

These laws were drawn originally by Edward M. Bassett and Frank B. Williams, counsel for the Regional Plan of New York and Its Environs. They were discussed at a meeting in White Plains last December at which twenty-two Westchester County municipalities were represented, and were fathered by a committee appointed at that meeting.

William A. White, Village Attorney of Scarsdale, was chairman of this committee, which included Mayor William A. Walsh of Yonkers, Village President H. M. Lee of Bronxville, Trustee F. T. Stephan of Ardsley, First Deputy County Attorney Charles M. Carter, and Mayor Frederick C. McLaughlin of White Plains ex officio. Frank B. Williams and Wayne D. Heydecker of the Regional Plan served with the committee as advisory counsel and secretary. The measures had the approval of William P. Capes, Executive Secretary of the Conference of Mayors and other City Officials of the State of New York.

The text of the city law follows. It is a permissive measure, applicable to all cities of the State of New York. The village law is identical in purpose and practically identical in wording.

Powers Greatly Needed by All Growing Communities

The new laws covered in the accompanying article:

1. Contemplate that a planning board, established by the legislative authorities of the municipality, shall prepare a master plan showing present and future streets and parks, the same not to be binding in any way but merely a guide for comprehensive planning.

2. Contemplate and empower the legislative authorities of every city and village to establish an official map of streets and parks. Main thoroughfares will be early determined for outlying districts. Later the secondary streets will be filled in through cooperation with the landowners.

3. Require the planning board to advise the legislative authorities, before they lay out streets or parks on the official map, or make changes therein. This assures careful and comprehensive planning.

4. Prevent the issue of permits for buildings on streets not on the official map, supplying, however, adequate safeguards for exceptional cases.

5. Prevent the issue of permits for buildings in the beds of streets shown on the official map, supplying, however, adequate safeguards for exceptional cases. This preserves the integrity of the city plan.

6. Prevent the filing of plats containing new streets without the written approval of the planning board. Such new streets then become part of the official map. This stops the erection of buildings on misfit private developments, and thus stops misfit street layouts.

7. Permit the planning boards in proper cases to lessen street widths shown in plats and in lieu thereof set aside playgrounds.

8. Permit the planning board to accommodate developers in making reasonable zoning changes for their plats.

An Act to Amend the General City Law, in Relation to Official Maps and Planning Boards

Section 1. Chapter 26 of the laws of 1909, entitled "An act in relation to cities, constituting chapter 21 of the consolidated laws," is hereby amended by adding thereto a new article, to be Article 3, to read as follows:

ARTICLE 3

Section 26. Official map, establishment
Section 27. Planning board, creation and appointment
Section 28. Planning board, officers, employees and expenses
29. Official map, changes
30. Planning board, reports on matters referred to it
31. Planning board, general reports
32. Approval of plats
33. Approval of plats, additional requisites
34. Record of plats
35. Permits for buildings in bed of mapped streets
36. Municipal improvements in streets; buildings not on mapped streets
37. Planning board, changes in zoning regulations
38. Boards of appeal

Official Map, Establishment

Section 26. Every city by ordinance or resolution of the legislative body which has the authority to lay out, adopt and establish streets, highways and parks may establish an official map or plan of the city showing the streets, highways and parks theretofore laid out, adopted and established by law, and such map or plan is to be deemed to be final and conclusive with respect to the location and width of streets and highways and the location of parks shown thereon. Such official map or plan is hereby declared to be established to conserve and promote the public health, safety and general welfare. Said ordinance or resolution shall make it the duty of some appropriate official or employee of said city at once to file with the clerk or register of the county or counties in which said city is situated a certificate showing that the city has established an official map or plan.

Planning Board, Creation and Appointment

Section 27. Such legislative body of each city is hereby authorized and empowered to create by resolution or ordinance a planning board of five members to be appointed by the mayor with authority to remove any member of such board for cause and after public hearing. Of the members of the board first appointed, one shall hold office for the term of one year, one for the term of two years, one for the term of three years, one for the term of four years, one for the term of five years, from and after his appointment. Their successors shall be appointed for the term of five years from and after expiration of the term of their predecessors in office. If a vacancy shall occur otherwise than by expiration of term, it shall be filled by appointment for the unexpired term. In any city in which there is a planning commission created in accordance with Article 12-a of the general municipal law the ordinance or resolution instead of providing for the appointment of a new planning commission or board may provide that the existing commission shall continue, the members thereof thereafter to be appointed in accordance with the provisions of said Article 12-a, with the powers and duties as specified for a planning board appointed as provided in this article in addition to the powers and duties as specified in said article 12-a; provided, however, that in any such city Section 238 of the general municipal law shall not be in force.

Planning Board, Officers, Employees and Expenses

Section 28. The mayor shall designate the member of said planning board to act as chairman thereof; or on his failure so to do, the planning board shall elect a chairman from its own members. It shall have the power and authority to employ experts and a staff, and to pay for their services and such other expenses as may be necessary and proper, not exceeding, in all, the appropriation that may be made for such board. Each city is hereby authorized and empowered to make such appropriation as it may see fit for such expenses, such appropriation to be made by those officers or bodies having charge of the appropriation of the public funds.

Official Map, Changes

Section 29. Such legislative body is authorized and empowered, whenever and as often as it may deem it for the public interest, to change or add to the official map or plan of the city so as to lay out new streets, highways or parks, or to widen or close existing streets, highways, or parks. At least ten days' notice of a public hearing on any proposed action with reference to such change in the official map or plan shall be published in an official publication of said city or in a newspaper of general circulation therein. Before making such addition or change the matter shall be referred to the planning board for report thereon, but if the planning board shall not make its report within thirty days of such reference, it shall forfeit the right further to suspend action. Such additions and changes when adopted shall become a part of the official map or plan of the city, and shall be deemed to be final and conclusive with respect to the location of the streets, highways and parks shown thereon.

The layout, widening or closing, or the approval of the layout, widening or closing of streets, highways or parks by the city under provisions of law other than those contained in this article shall be deemed to be a change or addition to the official map or plan, and shall be subject to all the provisions of this article.

Planning Board, Reports on Matters Referred to It

Section 30. The body creating such planning board may by general or special rule provide for the reference of any matter or class of matters to the planning board before final action thereon by the public body or officer of said city having final authority thereon with or without the provision that final action thereon shall not be taken until said planning board has submitted its report thereon or has had a reasonable time to be fixed in said rule to submit the report.

Planning Board, General Reports

Section 31. The planning board shall have full power and authority to make such investigations, maps and reports and recommendations in connection therewith relating to the planning and development of the city as to it seems desirable, providing the total expenditures of said board shall not exceed the appropriation for its expenses.

Approval of Plats

Section 32. The body creating such planning board may by ordinance or resolution authorize and empower the planning board to approve plats showing new streets or highways. Before such approval is given, a public hearing shall be held by the planning board, which hearing shall be advertised in any official paper or in a newspaper of general circulation in said city at least ten days before such hearing. The planning board may thereupon approve, modify and approve, or disapprove such plat. The approval required by this section or the refusal to approve shall take place within forty-five days from and after the time of the submission of the plat for approval; otherwise such plat shall be deemed to have been approved, and to certificate of such city as to the date of the submission of the plat for approval and the failure to take action thereon within such time, shall be issued on demand and shall be sufficient in lieu of the written endorsement or rather evidence of approval herein required. The ground of refusal of approval of any plat submitted shall

be stated upon the records of such planning board.

The ordinance or resolution authorizing the planning board to approve plats shall make it the duty of some appropriate official or employee of said city to file with the clerk or register of the county or counties in which said city is situated a certificate showing that said planning board has been so authorized and shall specify the officer or employee of said city who shall issue in its behalf the certificate of failure to take action as aforesaid.

Approval of Plats, Additional Requisites

Section 33. Before the approval by the planning board of a plat showing a new street or highway, such plat shall also in proper cases show a park or parks suitably located for playground or other recreation purposes. In approving such plats the planning board shall require that the streets and highways shall be of sufficient width and suitably located to accommodate the prospective traffic and to afford adequate light, air and access of fire-fighting equipment to buildings, and to be coordinated so as to compose a convenient system; that the land shown on such plats shall be provided with proper sanitary and drainage conditions; and that the parks shall be of reasonable size for neighborhood playgrounds or other recreation uses. In making such determination regarding streets, highways and parks the planning board shall take into consideration the prospective character of the development, whether dense residence, open residence, business or industrial.

Record of Plats

Section 34. No plat of a subdivision of land showing a new street or highway shall be filed or recorded in the office of the county clerk or registrar until it has been approved by a planning board which has been empowered to approve such plats, and such approval be endorsed in writing on the plat in such manner as the planning board may designate. After such plat is approved and filed, subject, however, to review by court as hereinafter provided, the streets, highways and parks shown on such plat shall be and become a part of the official map or plan of the city. The owner of the land or his agent who files the plat may add as part of the plat a notation if he so desires to the effect that no offer of dedication of such street, highways, or parks or any of them is made to the public.

In so far as provisions of law, other than those contained in this article, require the approval of a plat, map or plan of land by the authority of the city, as a prerequisite of its record, or allow it to be recorded on failure of the city to approve or disapprove of the same within a given time, said provisions shall not be in force in so far as they apply to plats, maps or plans of land within the limits of any city which has established an official map or plan and authorized a planning board appointed by it to approve plats of land within said city showing new streets and highways, under this article.

Permits for Building in Bed of Mapped Streets

Section 35. For the purpose of preserving the integrity of such official map or plan no permit shall hereafter be issued for any building in the bed of any street or highway shown or laid out on such map or plan, provided, however, that if the land within such mapped street or highway is not yielding a fair return on its value to the owner, the board of appeals or other similar board in any city which has established such a board having power to make variances or exception in zoning regulations shall have power in a specific case by the vote of a majority of its members to grant a permit for a building in such street or highway which will as little as practicable increase the cost of opening such street or highway, or tend to cause a change of such official map or plan, and such board may impose reasonable requirements as a condition of granting such permit, which requirements shall inure to the benefit of the city. Before taking any action authorized in this section, the board of appeals or similar board shall give a hearing at which parties in interest and others shall have an opportunity to be heard. At least fifteen days' notice of the time and place of such hearing shall be published in an official publication of said city or in a newspaper of general circulation therein. Any such decision shall be subject to review by certiorari order issued out of a court of record in the same manner and pursuant to the same provisions as in appeals from the decisions of such board upon zoning regulations.

Municipal Improvements in Streets; Buildings Not on Mapped Streets

Section 36. No public sewer or other municipal street utility or improvement shall be constructed in any street or highway until such street or highway is duly placed on the official map or plan. No permit for the erection of any building shall be issued unless a street or highway giving access to such proposed structure has been duly placed on the official map or plan. Where the enforcement of the provisions of this section would entail practical difficulty or unnecessary hardship, and where the circumstances of the case do not require the structure to be related to existing or proposed streets or highways, the applicant for such a permit may appeal from the decision of the administrative officer having charge of the issue of permits to the board of appeals or other similar board in any city which established a board having power to make variances or exceptions in zoning regulations, and the same provisions are hereby applied to such appeals and to such board as are provided in cases of appeals on zoning regulations. The board may in passing on such appeal make any reasonable exception and issue the permit subject to conditions that will protect any future street or highway layout. Any such decision shall be subject to review by certiorari order issued out of a court of record in the same manner and pursuant to the same provisions as in appeals from the decisions of such board upon zoning regulations.

Planning Board, Changes in Zoning Regulations

Section 37. The body creating said planning board is hereby authorized by ordinances or resolution applicable to the zoning regulations of such city or any portion of such zoning regulations, to empower it, simultaneously with the approval of any such plat, either to confirm the zoning regulations of the land so platted as shown on the official zoning maps of the city or to make any reasonable change therein, and such board is hereby empowered to make such change. The owner of the land shown on the plat may submit with the plat a proposed building plan indicating

lots where group houses for residences or apartment houses or local stores and shops are proposed to be built. Such building shall indicate for each lot or proposed building unit the maximum density of population that may exist thereon and the minimum yard requirements. Such plan, if approved by the planning board, shall modify, change or supplement the zoning regulations of the land shown on the plat within the limitations prescribed by such legislative body in said ordinance or resolution. Provided that for such land so shown there shall not be a greater average density of population or cover of the land with buildings than is permitted in the district wherein such land lies as shown on the official zoning map. Such building plan shall not be approved by the planning board unless in its judgment the appropriate use of adjoining land is reasonably safeguarded and such plan is consistent with the public welfare. Before the board shall make any change in the zoning regulations there shall be a public hearing preceded by the same notice as in the case of the approval of the plat itself. On the filing of the plat in the office of the county clerk or registrar such changes, subject, however, to review by court as hereinafter provided, shall be and become part of the zoning regulations of the city, shall take the place of any regulations established by the board of estimate or other legislative authority of the city, shall be enforced in the same manner and shall be similarly subject to change.

Boards of Appeal

Section 38. Any person or persons, jointly or severally aggrieved by any decision of the planning board concerning such plat or the changing of the zoning regulations of such land, or any officer, department, board or bureau of the city, may present to a court of record a petition, duly verified, setting forth that such decision is illegal, in whole or in part, specifying the grounds of the illegality. Such petition must be presented to the court within thirty days after the filing of a decision in the office of the board.

Upon the presentation of such petitions, the court may allow a certiorari order directed to the planning board to review such decision of the planning board and shall prescribe therein the time within which a return thereto must be made and served upon the realtor's attorney, which shall not be less than ten days and may be extended by the court. The allowance of the order shall stay proceedings upon the decision appealed from.

The planning board shall not be required to return the original papers acted upon by it, but it shall be sufficient to return certified or sworn copies thereof or of such portions thereof as may be called for by such order. The return must concisely set forth such other facts as may be pertinent and material to show the grounds of the decision appealed from and must be verified.

If, upon the hearing, it shall appear to the court that testimony is necessary for the proper disposition of the matter, it may take evidence or appoint a referee to take such evidence as it may direct and report the same to the court with his findings of fact and conclusions of law, which shall constitute a part of the proceedings upon which the determination of the court shall be made. The court may reverse or affirm, wholly or partly, or may modify the decision brought up for review.

Costs shall not be allowed against the planning board, unless it shall appear to the court that it acted with gross negligence or in bad faith or with malice in making the decision appealed from.

All issues in any proceeding under this section shall have preference over all other civil actions and proceedings.

Section 2. This act shall take effect immediately.

Special Material Available for Independence Day Celebrations This Year

THOUGH Philadelphia is the proud possessor of Independence Hall and the Liberty Bell, it ought to have no monopoly of sesqui-centennial celebrations on Independence Day this year. Just 150 years ago this July Fourth, the Liberty Bell rang out the signing of the Declaration of Independence. So this year a celebration of America's liberty is particularly appropriate for Independence Day.

A new pageant play, "Toward Liberty," by Lucy Barton, has been prepared especially for the Sesqui-Centennial and is obtainable from the Playground and Recreation Association of America, 315 Fourth Avenue, New York City, price 25 cents. This play runs about three-quarters of an hour and requires only curtains as a stage setting. Events in American colonial history which led to the independence of the colonies are dramatized, with two opposing characters, "Despotism" and "The New Age," sustaining the argument. In England, Edmund Burke appears before Parliament with his famous speech on conciliation; in America is heard Patrick Henry's great protest ending, "Give me liberty or give me death."

A list of plays, pageants, books, and other available material pertaining to the Sesqui-Centennial has just been prepared by the Playground Association and will be sent at a nominal charge.

Pittsburgh Votes $19,902,000 in Bonds

AT the primary election on May 18, the voters of Pittsburgh approved bond issues aggregating $19,902,000. The schedule comprises ten general divisions as follows:

Water-works improvements	$3,900,000
Bridges	1,450,000
Sewerage and drainage, streets	2,000,000
Improvements at Mayview	2,500,000
Recreation	750,000
Completion of 1919 bond issue items, streets	1,870,000
Completion of 1919 bond issue items, bridges	455,000
Street improvements	6,127,000
Tuberculosis Hospital	250,000
Department of Public Safety, Fire Equipment and Fire Buildings	600,000
Total	$19,902,000

The Pittsburgh Chamber of Commerce, through its Committee on Municipal Affairs, made a careful study of each item in the foregoing schedule, and in the light of facts submitted by Edward G. Lang, Director, and C. M. Reppert, Chief Engineer of the Department of Public Works, expressed its belief that from the standpoint of necessity, city development, and public economy, the whole amount of $19,902,000 should receive the approval of the voters.

Public Utilities

A New Department Conducted for THE AMERICAN CITY by Professional Members of the American Public Utilities Bureau, 50 Madison Ave., New York:

JOHN BAUER
Rates and Finance
J. C. BRACKENRIDGE
Railroads
BENJAMIN COHEN
Gas Investigations
WALTER JACKSON
Street Railways & Busses
GEORGE A. JOHNSON
Water-Supply and Sanitation
LAMAR LYNDON
Electric Light and Power
MANFRED K. TOEPPEN
Telephones
MARK WOLFF
Accounting

Factors in Rate Determination

THE article in the series on public utility regulation which appeared in the May issue dealt with the history and purpose of regulation. In this issue the factors which enter into the fixation of rates will be indicated and defined, without getting into a discussion of any phases of the problems involved in the consideration of the various factors. These will be dealt with in subsequent issues, and the differences between the public and the company point of view will be fully discussed.

The determination of rates by public service commissions or local authorities and the review of rates by courts or other governmental agencies involve the determination of certain elements which compose the basis of all rates. These may be classed as follows:

1. Cost of operations or rendering service
2. Amount or value of investment actually used in rendering service
3. The rate of return on such investment

Costs of Operation or Rendering Service

The first item, which is the cost of operations, covers all the costs connected with the furnishing of the service. For instance, in the case of a gas company this includes coal for boilers and generators, water gas oil, wages of employees, cost of repairs, cost of running the commercial, new business, and meter departments and the general office, as well as all other miscellaneous expenses. It also includes an amount which the company is entitled to charge up as part of the cost of rendering service, to cover depreciation or the "wear and tear" in the machinery and equipment used in operations which has not been made good by repairs and replacements. While this involves no immediate out-of-pocket expense, it is nevertheless a part of such cost of operations. Taxes to municipal, state, and federal authorities are also a part of the cost.

This group (No. 1) is the most important factor in rate determination, because it forms the biggest single item involved in computing the rate. In the case of gas and electric companies, operating expenses and taxes usually run from about 60 per cent to 75 per cent of every dollar collected for service. Naturally, any rise in the price of commodities which increases the operating expenses tends towards making the rate less adequate; a recession in prices has the opposite effect on expenses and rates.

Investment Devoted to Rendering Service

The second factor which has to be determined is the value of the investment devoted to the rendering of the service. Operating expenses are usually easily and quickly ascertainable; the determination of the amount of the investment, on the other hand, presents many difficulties. There is a wide difference of opinion between the representatives of the public and of the companies as to the particular method or measure of valuation that should be used in arriving at the "value" of various items of property used. The decisions of courts and commissions have been rather conflicting. The divergent viewpoints on this subject will be presented in subsequent issues. All that will be attempted here is to indicate the items of property for which a valuation has to be determined in arriving at a rate base. These may be grouped as follows:

1. Real estate
2. Plant and equipment
3. The depreciation existing in the plant and equipment
4. Working capital
5. Going concern value

The item of real estate needs no comment, for we are all familiar with the fact that public utility companies have a considerable investment in real estate which is used in rendering service. Also, it is generally recognized that the bulk of the investment of utilities consists in plant and equipment. In the case of gas and electric companies these items usually amount to about 75 per cent of the total investment.

WORKING CAPITAL

In every rate proceeding an estimate has also to be made of the amount of cash, materials, and supplies and other liquid assets which are used in carrying on the operations of a utility. These are commonly designated as "working capital." Public utilities, like all other business enterprises, must have working funds. Gas and electric companies require a liberal supply of cash, stocks of coal, oil and other manufacturing and repair materials, to insure uninterrupted service. Considerable time usually elapses between the furnishing of service and the collection of money from consumers. For example, at any period a sizable amount of gas or electricity has been used by consumers which has not yet been billed, or, if billed, has not yet been paid for. The company

must carry the amount of such outlay. It should be remembered, however, that utilities, like other businesses, do not have to pay cash for all their requirements of materials, supplies, and service. They usually buy on credit, and owe considerable money. Such accounts payable are an offset against the amounts which have either not been billed, or, if billed, have not yet been paid for by consumers. Considerable difference of opinion exists as to the proper method of computing an allowance for "working capital." The public and the company points of view are usually very far apart, as also are decisions of courts and commissions, as will be shown later.

GOING CONCERN VALUE

In recent years, another element has been injected into the determination of rates. The companies contend that when a valuation is made of the plant, equipment, and working capital of a public utility, there should be added thereto an allowance for what is called "going concern value." Perhaps the best way to define this item is to state briefly the views of the utilities whereon are based their claims for such additional allowance. It is their contention that a utility is entitled to a return on its efforts and expenditures in creating the business which it has at the time that the valuation is made. Their position is this: It costs money to assemble a plant and to get it to a point where it operates smoothly and efficiently; that after a plant is constructed it takes a year or two before it is "ironed out" and operates efficiently. It also costs money to perfect an organization and to get together a personnel to take care of the business; also considerable effort and money are expended in attaching consumers and educating them to the fullest use of their service, such as gas, electricity, or telephone. These factors, they claim, make the company a "going concern," and have a fairly definite value, for which a separate allowance should be made in the rate base. The public point of view is directly opposed to that of the utilities, the contention being, in short, that, while it is true that it costs money to do those things, the utilities charge these items up in the cost of operations and include them in the rates collected, and they should not be paid twice.

DEPRECIATION IN PLANT AND EQUIPMENT

After a valuation has been set upon a plant and equipment, the rate base is not complete until a determination has been made of the amount of depreciation which exists in such plant and equipment, as well as the amount which the company is entitled to charge to operations yearly to create a reserve which will take care of retirements necessitated through the complete wearing-out of equipment. It should be borne in mind that the machinery which composes the plant is constantly being used up in operations, just as surely as a coal pile or a stock of any other materials. The only difference between the two is that a coal pile is used up quickly, while a machine may last ten or twenty years. If the accounting period were the same as the life of the machine, no differentiation in treatment would be necessary in accounting for the cost of coal used and the cost of that machine. But as the accounting period is one year, the cost applicable to that year has to be ascertained. In the case of coal or other supplies, that is very readily obtained by taking measurements. In the case of machinery an estimate has to be made by a qualified engineer, who on inspection of the machine can readily determine its elapsed life and probable future life. In order to state the operations of any year correctly, there has to be added to the cost of the materials and other items consumed, a sum which will represent the proportion of the cost of the machine which has become exhausted or used up in operations. This is termed the depreciation which has accrued during the period.

The amounts charged up to operations, representing the depreciation which has taken place in the machine, are set aside in a separate account to await the complete exhaustion or wearing-out of the machine to the point where it has to be withdrawn from the service. Were this not done, it is obvious that the operations in those years where no machinery had to be replaced, would show a profit, and then would follow tremendous losses in the years when the machinery had become so completely worn out that it had to be replaced and the new one charged to operations. By spreading the cost of the machine over the years in which it gives service, the cost of operations is accurately stated and kept uniform and, in addition, the money is accumulated with which to purchase new machinery to replace that worn out. It is obvious that if this procedure is not followed out, a company might pay big dividends (out of capital) in the years where no retirements and replacements were necessary, only to find it did not have the cash with which to purchase new machinery to replace that which had become worn out in service.

The ascertainment of the amount of depreciation existing in any property and the amount to be set aside annually in a reserve to anticipate the time when some of the property will have to be retired, is a very difficult problem, and is the work of engineers who are especially qualified by experience to judge the expired life of the machinery and its future life. When the total depreciation in a property has been ascertained, it is deducted from the valuation of the company's plant and equipment. The balance is the "value" of the plant at its present condition.

FIXING THE RATE OF RETURN

The real estate, plant and equipment diminished by the depreciation existing therein, plus the working capital and an allowance for "going concern value" (if any), compose the rate base. The next step is to fix the rate of the return to be earned by the utility. It usually runs from 6 to 8 per cent. The usual method of financing a public utility is to borrow money by issuing bonds to the extent of, say, 70 per cent of the requirements, and stocks to say 30 per cent of the requirements. Bonds carry a fixed rate of interest and are usually secured by a mortgage on the property. Stocks, as a rule, do not have a fixed rate of return or dividends, although lately there has been issued quite an amount of preferred stock having a fixed dividend rate. The money derived from the proceeds of stocks and bonds is used for building the plant; the dividends or interest which the bondholders and stockholders respectively receive is their compensation for their money which the company used to build the plant. The amount of return allowed in any case is the sum which is

to be used to pay bondholders' interest and stockholders' dividends, and the balance, if any, put aside as surplus. It is natural, therefore, that bondholders and stockholders would like to see a high rate of return allowed. The public, on the other hand, would like to see the rate of return kept low to keep down the rates.

The method used to fix rates will appear more clearly in the illustration which follows and which summarizes what was intended to be presented in this article:

Let us assume that a gas company owns real estate valued at	$1,000,000
Its plant and equipment is valued at	3,000,000
Total	4,000,000
The depreciation existing in plant and equipment is estimated at	500,000
This gives a balance of	3,500,000
It uses in furnishing service "working capital" to the extent of	300,000
Also, it is found that the company has a "going value" of	400,000
The total rate base is therefore	4,200,000
Let us assume that a 7 per cent return has been found as proper in this case. The company, therefore, is entitled to earn 7 per cent on the rate base of $4,200,000, or	294,000
Let us further assume that the gas company sells 1,000,000 M. cubic ft. of gas per year. Its operating expenses and taxes, let us say, are	1,000,000
It therefore follows that the company has to have revenues which will cover the cost of its operations $1,000,000, and earn a return of $294,000 on its investment, or a total of	1,294,000

If it sells 1,000,000 M. cubic feet of gas annually, it is readily seen that the required rate per thousand is $1.294 or, in round figures, $1.30.

BENJAMIN COHEN.

An Example of Futility in Present Methods of Public Utility Regulation

In the April issue of THE AMERICAN CITY *there was discussed the recent decision in the telephone case involving rates in New York City and State. The importance of the case and the results of this litigation are likely to be so far-reaching in their effect on regulation throughout the country that it seems advisable to give a history of this case.*

THE controversy over telephone rates in New York now before the State Public Service Commission and the Federal Court simultaneously, furnishes a typical example of the chaos in our present methods of regulation.

In the latter part of 1913 the Public Service Commission started an investigation of the rates then in force. In December, 1913, the State Legislature made a thorough investigation of the organization, rates, service, etc., of the New York Telephone Company and, in January, 1914, a temporary horizontal reduction of 10 per cent in the measured-rate was secured. A committee appointed by the Legislature submitted a report to the New York State Senate, dated February 26, 1915, recommending a decrease in rates equivalent to about $3,000,000, to be put in effect July 1, 1915, and to remain in force two or three years. The commission acted in accordance with these recommendations.

The rate base agreed upon at that time was not derived from any specific formula or principle, but was a compromise for the purpose of this particular proceeding. Then followed Federal control, when the properties were in possession of the United States Government (August 1, 1918, to July 31, 1919) and, therefore, no question of rates was raised, but immediately after the return of the properties to the company, the rate controversy started anew. The Commission instituted an investigation August 19, 1919. The company offered and the Commission accepted a reduction of 8 per cent in rates for local exchange service, effective October 1, 1919, for one year.

Before the expiration of the year, however (on August 28, 1920), the company petitioned the Commission to institute new rates which would increase its annual revenues by $11,000,000. Hearings were begun on October 18, 1920, and continued for two years. There was a mass of testimony and exhibits. On March 17, 1921, upon the petition of the company, a temporary increase was granted which eliminated the 8 per cent reduction of October 1, 1919, and added a surcharge of 20 per cent, effective April 1, 1921. As the result of a protest from the subscribers, the city of New York applied to the Commission for a reduction in the temporary rates. On June 16, 1921, a reduction in the surcharge was made from 20 per cent to 10 per cent, effective July 1, 1921.

On further complaints from the public and the city, the Commission on March 3, 1922, again ordered a reduction in the surcharge from 10 per cent to 5 per cent, effective April 1, 1922. But the company obtained from the Federal Court a temporary restraining order, and an injunction *pendente lite* was granted by the Statutory Court June 12, 1922. A master was appointed, but hearings before him were postponed pending the Commission's final order, which came on January 25, 1923. It rearranged the rate schedule in a way resulting in an increase of about 5 per cent, effective March 1, 1923.

Again the Commission failed to rest the rate base on "values" or upon any particular formula or principle, and this settlement failed to settle. On January 31, 1924, the company asked consent of the Commission to make an immediate temporary increase in rates on the ground that it had failed to earn the net return which the Commission had intended it should earn in 1923 by $3,000,000 in the entire state, and that it would fall short of an adequate return in 1924 by more than $7,500,000 if the rates in effect were continued.

But while the hearings, which were begun on February 26, 1924, were pending, the company applied to the Federal Court on April 25, and obtained a temporary increase of 10 per cent, effective May 1, 1924. The Commission hearings were closed May 23, 1924. Meanwhile the question was

also considered by a Statutory Court whether to allow the temporary increase to continue and what further disposition should be made.

On July 17, 1924, the Commission denied the petition of the company for a temporary increase.

On July 26, 1924, the Statutory Court decided that the 10 per cent increase remain in effect and that a special master be appointed to hear the case. On September 2 a special master was appointed, and at the present time hearings are going on before the master. The hearings before the Commission were closed February 26, 1926. Meanwhile, on December 18, 1925, the company petitioned the Statutory Court for a further temporary increase in rates, amounting to 25 per cent in the city and a lesser percentage up-state. On March 10, 1926, the Statutory Court refused to grant the temporary increase.

Here we have the spectacle of an exceedingly important utiltity whose properties are valued on an arbitrary basis; whose rates are changed up or down at frequent intervals, according as one or the other of the parties becomes insistent; the same points at issue are raised again and again; and, finally, the case is up for consideration simultaneously before the Commission and the Court. And there is no prospect of anything permanent being decided by either body.

Is it not manifest that our present method of regulation is utterly futile? Much too large a percentage of whatever amount may be saved the public under such rate control is consumed in continuous cost of litigation.

This case has been thus presented, not with the intent to cast any reflection upon the financial and public policy of an outstandingly efficient utility company, but merely as an illustration of the chaotic condition of regulation.

Here is not the place to outline a solution to this problem. All we can say is that, if regulation is to be a reality, the rate base and the rate of return will have to rest upon a firm principle, not upon an illusive and elusive formula of "fair return upon fair value." Either regulation will have to be abandoned altogether or its fundamental basis will have to be clarified and its methods rendered workable.

Items of Public Utility News

Non-Voting Stock Disapproved

NEW JERSEY.—By a decision of the Board of Public Utility Commissioners of New Jersey, recently rendered, discussion of the advisability of permitting an issue of non-voting common stock has been raised anew.

The applicant was a bus company, but the decision was made on the basis of that company's being a public utility. The Commission ruled against permitting the issue. Not only did it so hold with respect to the common stock, but it ruled similarly with respect to the 7 per cent cumulative preferred stock, an issue that did not provide for voting power at any time. The Board took cognizance of the fact that the issue of common stock with no voting power might be in accordance with the corporation act, but it disagreed with counsel for the applicant that compliance with the provisions of the corporation act in the issue of this class of stock left the Board without further discretion in the matter of giving its approval.

The decision follows the reasoning in a recent ruling by the Interstate Commerce Commission in the so-called Nickel Plate Consolidation, and is in line with the objections raised recently by Professor Ripley in a protest that reached President Coolidge.

Professor Ripley's principal fear is best described by what he has termed "the alarming divorce of ownership of property, represented by securities omitted by corporations or trustees, from any direct accountability whatsoever for its prudent and efficient management."

The substance of the New Jersey ruling, the Interstate Commerce Commission decision, and the objection of Prof. Ripley is the deprivation of the owners of a voice in management. On one occasion, in commenting on the willingness of investors supinely to submit to domination of their companies by minority, he asked how there could be other than a whirlwind of abuse and power under such conditions.

There are many points of interest in the New Jersey decision.

Subway Improvements in New York

NEW YORK CITY.—Orders issued by the New York Transit Commission to the Interborough Rapid Transit Company require that company to spend approximately $22,000,000 on lengthening station platforms and buying new cars and equipment. The order requires the company to pay one-half (about $6,000,000) of the cost of lengthening 56 underground platforms and 23 elevated platforms at local stations to accommodate ten-car trains. The city is required to pay the other half. The order also requires the Interborough to buy 382 new cars, costing about $10,000,000, and spend about $6,000,000 for signals, repair sheds, power equipment, etc.

The order becomes effective on July 1, next.

New York State Generates One-Sixth of All Electricity Produced in the United States

NEW YORK.—New York State has almost doubled its electrical generating capacity and has increased its consumption of electricity by one-third in the last three years. It is estimated that seventy-six reductions in rates during the period have saved consumers more than $3,000,000 annually. Ranking first in installed hydroelectric generating capacity as well as in steam generating capacity, this state produces and uses one-sixth of all electricity produced in the country.

Since 1922 the yearly per capita use of electricity in New York State has increased from 715 kilowatt-hours to 940 kilowatt-hours, according to an estimate by the New York Committee on Public Utility Information. While the sources of electrical supply and the use of electricity have thus increased, the spread of consolidations has decreased the number of companies in that period by 37.

Privately owned companies have decreased by 31, and 6 of the 59 publicly owned plants operating in 1923 have been supplanted by privately owned systems. Inter-connection of plants has been responsible for many of these changes. Consolidations have resulted in increased efficiency and economy.

Lease of City Gas Works to Utility

PHILADELPHIA, PA.—The Public Service Commission has announced its approval at Harrisburg of the new lease of the city gas works to the United Gas Improvement Company.

The new lease will succeed the present contract with the U. G. I., which expires at the end of next year. It was approved unanimously by City Council on February 4, and signed by Mayor Kendrick the following day.

The new lease continues the existing rate of $1 per 1,000 cubic feet as a basic cost to the consumer until changed, the changes to be based upon increase or decrease in operating expenses. The U. G. I. also is allowed a minimum payment of $800,000 and a maximum of $1,100,000, based on the quantity of gas sold and economies in operation and management. The city is to receive $4,200,000 annual rental from the gas company.

Another new provision is that creating a Gas Commission of three members at $5,000 each, to serve in a regulatory capacity. One member is to be appointed by the Mayor, and one by the U. G. I., and these two are to select a third. In the event of their inability to agree, the Public Service Commission will be called upon to designate the third member. The lease provides that the company continue to furnish the 530 British thermal unit heating value. The change is standard from 22 candlepower and was made during the war with the consent of counsel.

The new lease is approved for an initial term of eleven years, and for successive extensions of ten years each thereafter. Provision is made for schedules of alternative rates for large consumers of gas. Yearly improvements amounting to not more than $2,000,000 are to be paid out of the receipts for gas. Over that sum the city may provide the necesary funds.

Detroit Jitney Bus Traffic Ordinance Upheld

DETROIT, MICH.—The Michigan Supreme Court has reversed the decision of the Wayne County Circuit Court and upheld the validity of the Detroit ordinance regulating jitney bus traffic on Detroit streets. The Court ruled that the legislative department of the city of Detroit has determined that the ordinance is for the public's welfare and for the public good, and the ordinance was declared valid on these grounds. The Corporation Counsel's office will draw a reasonable ordinance regulating all public conveyances operating on the streets of Detroit, including jitneys, busses, and taxis. The effect of the decision will be to give Detroit absolute control over its streets.

Service-at-Cost Franchise for United Railways of St. Louis

ST. LOUIS, MO.—Essentials of the new franchise for the United Railways have been determined by the city administration. The new grant will provide for service at cost. The measure will prescribe that the cities shall determine the character of the service, paying a fare necessary to produce such service. The other controlling factors will be the rate of return the company shall receive and the valuation on which the return shall be earned. The valuation fixed by the Missouri Public Service Commission, approximately $57,500,000, has been adopted tentatively by the city. The State Commission has held that the company is entitled to earn 7 per cent return on its valuation. Additions to capital account would include only such sums as were actually expended.

It is said that the present city fare of 7 cents is not sufficient to net a 7 per cent return on $57,500,000, unless there is a large increase in revenues or a substantial cut in operating expenses. The reorganization committee, however, has expressed the hope that it will be able to put into effect operating economies that will not only permit the fare to remain at 7 cents, but also improve the service.

The 7 per cent return on the company's valuation has been tentatively agreed upon.

The position of director of transportation or traffic will be created. That official will have supervision of the company for the city. This presents the difficulty that under the city charter the occupant of this office must be a subordinate of the Director of Public Utilities, a post that pays $8,000. It appears probable, on the other hand, that as much as $15,000 a year must be paid to obtain a man sufficiently efficient properly to fill the position of director of transportation.

Mayor Miller and officials of the organization committee are also considering the creation of a Board of Control, to include one representative of the company, and the appointment of a Director of Transportation representing the city, whose decisions would be subject to review by a board of arbitration.

New Street-Lighting Rate Basis Disapproved

PENNSYLVANIA.—The Public Service Commission has refused to sanction the introduction into Pennsylvania of a new rate for municipal street lighting whereby a charge is made for each mile of distribution line used in furnishing service. Refusal of the commission was made in the case of contracts between the Metropolitan Edison Company and thirteen boroughs and townships in Berks, Lebanon, and Lancaster Counties.

In refusing approval the Commission made the following comment on the attempt to introduce the new rate into Pennsylvania.

"The company proposes to charge an annual rate of $200 per mile of distribution line used in furnishing the service, plus a charge per lamp ranging from $11 to $50, dependent upon the candlepower of the lamp. This proposed rate increases the present rate charged the municipalities from 30 to 50 per cent.

"Entirely apart from the principle upon which the new rate is based, the data and evidence submitted in support thereof do not satisfy us that either the line charge or the lamp charge is just and reasonable.

"We therefore find and determine that the evidence submitted and the records fail to establish that the approval of the proposed contracts is necessary and proper for the service, accommodation, and convenience of the public. Orders will therefore issue refusing approval."

The Broadening Conception of Local Transportation

(An Editorial from the *Electric Railway Journal*)

TRANSPORTATION is one of the most important elements in the complicated machinery of modern life and business. But important as is the matter of long-distance transportation of materials and finished products between their sources, points of manufacture and distribution centers, the problems of this phase of transportation are being overshadowed by the situation within great industrial and commercial communities. The losses and waste in what may be classed as purely local transportation of people and commodities are a staggering load on business.

Setting aside for the moment all considerations of convenience, comfort and safety, and viewing the subject solely as a matter of economics, community transportation today presents an appalling situation. Although industrial efficiency has won for America its present position of world leadership, jamming of the local transportation mechanism threatens the future. Overlapping and duplication in the many forms of transportation for both passengers and commodities within industrial areas is causing a large part of the difficulty. Stand for a moment at any busy city street intersection and consider the cost of the lack of coordinated transportation facilities!

Here is a challenge to American initiative and resourcefulness. There is in this condition a community problem that has not been adequately recognized. Present conditions have been largely brought about by failure to consider local transportation as a whole. Street cars, elevated lines, subways, steam road commutation service, busses, taxicabs, private vehicles and the multitudinous deliveries of goods and commodities within the metropolitan areas of large cities make up the complicated traffic that attempts to use—with little coordination and much overlapping, interference and waste—the limited arteries available.

Those responsible for the operation of these various transportation agencies are primarily electric railway men, steam railway men, bus men, taxicab men, truck men, etc., rather than local transportation men. The narrow viewpoint of the past has caused each agency to endeavor to work out its own destiny independently of the others. The result has been little short of chaos.

The solution lies in a broadened perspective of the community transportation problem. Local transportation men of the future will fabricate from the many diverse and overlapping agencies, a coordinated structure fitted to the needs of modern cities. They face a complicated and difficult task, to be sure. To master it they will need to strip themselves of the fetters of precedent and self-satisfaction. But in this broadened conception of local transportation as an industry lies opportunity adequate to compensate for the im agination, courage and effort required.

Forward Steps

Reported by Municipal Officials and Chamber of Commerce Executives

Frequent Inspections Replace Clean-Up Week

NEW YORK CITY.—The annual Clean-Up Week plan of getting rid of accumulations of rubbish has been abandoned in New York City in favor of more extended and intensive clean-up activities. The Clean-Up Week has become an established institution throughout the country and the advisability of holding it has never been seriously questioned in New York until an inquiry was undertaken by The Merchants' Association to find out whether it was worth while or not. The Association's Anti-Litter Bureau is at work all the year round through fifteen thousand Block Captains enrolled chiefly in the high schools of the city. The Bureau weighed the results of the annual Clean-Up Week and found that they were not of a character to justify its continuance. The program in New York has been that once a year all householders in designated areas should bring out their accumulated litter and rubbish and deposit it at stated times where the Street Cleaning Department could conveniently get at it. The tendency of this plan was found rather to encourage the accumulation of débris than to secure its removal.

It is notorious that such accumulations are highly inflammable and that they frequently constitute dangerous fire hazards contributing enormously to the huge avoidable fire losses which occur annually in this country.

As a substitute for the annual Clean-Up Week, The Merchants' Association authorized the Manager of its Anti-Litter Bureau to propose to the heads of the Health, Street Cleaning, Tenement House, and Police Departments, and the Fire Prevention Bureau in the Fire Department, a plan for making frequent inspections of all parts of the city, concentrating upon the more congested districts where conditions are naturally most serious. The idea was welcomed by the city officials. The first result of the conference was to disclose the fact that the appropriations made for the various departments whose duty it is to make inspections had been so reduced that in some cases, especially in the Tenement House Department, adequate inspections even under the existing law were impossible. Upon being informed of this situation the Board of Estimate promptly made an additional appropriation to this Department for more inspectors.

The results of the new plan will be watched with much interest. It has been generally received by the press as a welcome substitute for the annual effort to keep clean. Hereafter New York City will not "wait for Saturday night," but will endeavor to keep itself presentable at all times.

An especial effort is also being made this year by a large number of civic and commercial organizations to keep the parks in better condition during the warm weather. The habit of strewing newspapers, lunch boxes, and débris of all kinds over the parks, especially on holidays, has become so ingrained that it constitutes a genuine disgrace. Many public-spirited women are taking an active part in this movement to protect the parks, and excellent results are expected.

W. S. McGRANE,
Manager Anti-Litter Bureau, The Merchants' Association of New York.

Atlantic City to Have a Unique Convention Hall

ATLANTIC CITY, N. J.—A new convention hall, which it is believed will be the largest auditorium in the world, will soon be added to Atlantic City's attractions as a convention city. The construction of the hall, for which Lockwood, Green & Company, of Boston, are the architects and engineers, was started early this year and will probably be completed in 1927.

A conveniently located site, with a frontage of 350 feet on the Boardwalk and a depth of 650 feet, was chosen for the new building. The main auditorium will have a seating capacity of 30,000 on the floor and stage, with 10,000 additional in the balcony, and will be large enough to accommodate running and athletic games of all descriptions, circuses, and exhibitions. It will also be possible to flood the floor for ice-skating carnivals. As is necessary in a hall of such size, provisions are made for large amplifiers, so that speakers may be heard clearly in all parts of the auditorium. Elaborate lighting effects will be arranged for evening meetings. The stage is to be 100 x 50 feet with a width of 180 feet in the wings, and will have full property and dressing-room equipment. A clearance of 14 feet beneath the balcony will permit the use of the entire floor of the main hall for expositions, and cranes are to be installed on two sides of the building so that large objects for exhibit can be lifted without difficulty into the hall. A series of small rooms on the balcony level are planned for permanent exhibits and for use as committee rooms during large conventions.

In addition to the main auditorium, there will be a separate hall in the front of the building to be used for art exhibits. This will also have a stage and a seating capacity of 3,000. Other committee rooms and retiring-rooms surround this hall.

As a precaution against blockage in the doorways during large gatherings, it is planned to have the public use a one-way entrance to reach the main lobby on the ground level, from which connections can be made with all sections of the building, and to leave by a one-way exit on the oppo-

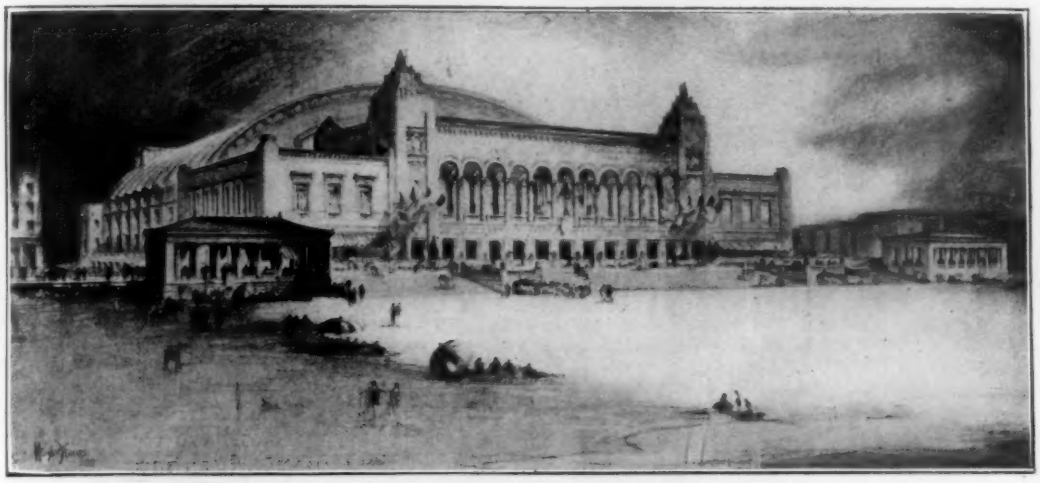
site side. Terraced sidewalks on both sides, in addition to ramp inclines from the ground, will further facilitate the handling of crowds.

A particularly interesting feature of the structure will be a flight of stadium steps leading to the beach for use especially during the many pageants held each year at the resort. Shelters for the public will be erected at either end of these steps. The main entrance is being planned to permit pageants with floats to pass from the Boardwalk directly into the auditorium for review. Another welcome feature will be the bath-houses for men and for women to be provided on the ground floor.

In the arcade extending across the entire front of the building along the Boardwalk fourteen stores will be located, with a 48-foot-wide central entrance to the hall. Twenty-one stores will be located on the street level at the rear of the hall.

For the front exterior of the structure, limestone and marble will be used, and brick of a light color to match the stone will be used for the remaining walls. The entire building will be of fireproof construction.

EDWARD L. BADER,
Mayor.



THE PROPOSED AUDITORIUM FOR ATLANTIC CITY, N. J.

A Pageant in Honor of New Americans

CANTON, OHIO.—The Canton Chamber of Commerce, through its Americanization Committee, recently assisted in staging an elaborate pageant in honor of 89 new citizens of the United States. The event, called The Pageant of the Nations, was attended by approximately 1,500 persons.

Successful in every respect, the pageant proved exceptionally entertaining and educational. Even the committee in charge, which had been active for a number of weeks in preparation of the impressive program, was surprised at the results of the event.

Two brief talks, music by two bands and a male chorus, a series of native folk dances in costume, and important events in American history portrayed in tableaux were features of the program. The presentation of certificates of citizenship to the 89 foreign-born men and women was made the concluding part of the evening's program.

The pageant was the first event of its kind ever to be held in Canton. More than two hundred persons participated in the program. Expenses were taken care of by a small admission charge. Five organizations assisted in arrangements and in advance ticket sale.

Canton has been given wide publicity through the excellent Americanization work which the city is doing. The Canton public evening schools, whose work includes Americanization activities, are considered among the best schools of the kind in the country.

DALLAS L. HOSTETLER,
Assistant Manager, The Canton Chamber of Commerce.

Building Better Boyhood in Two Rivers

TWO RIVERS, WIS.—Since the spring of 1924, the Two Rivers Boys' Work Association has been in operation, organizing activities for the development of boyhood along proper lines. Of a fund of almost $20,000 contributed by local agencies and individuals interested in the welfare of our future citizens, over $11,000 has been expended up to the present time.

Prior to the organization of the Boys' Work Association, a committee of the Two Rivers Rotary Club made a careful survey of boy life in this community, reaching the conclusion that this boy problem was one to be worked out by the community as a whole rather than by any one society or club. A community-wide Boys' Work movement was then launched. Out of Two Rivers' population of approximately 8,000, 250 men were chosen to promote the work, serving under a board of governors, with J. E. Dennison as General Director. The city provided a headquarters for the Association, and offered the use of the public schools, City Hall, or any other public building for its activities.

Clubs have been formed to meet the needs and interests of boys of all ages, each organization having the same fourfold purpose—mental, physical, social, and religious development. The find-

Simplicity, Economical Operation Plus Dependability in the Model "L"

COLDWELL LAWN MOWERS—since 1867—have been known as dependable, economical machines. Some Coldwell hand mowers sold 35 years ago are still cutting lawns. Coldwell mowers require less sharpening and fewer repairs. As new developments have come along and have been tested and found worthy, they have been incorporated in Coldwell Mowers.

The Model "L", pictured above, "the park favorite", cuts a 25 inch swath and with the new gang units attached, it cuts a 60 inch swath—10 acres a day on one gallon of gasoline.

The new Electric Lawn Mower is *"as easy to operate as a vacuum cleaner"*. Propels itself and mows as it goes. Connects to any electric outlet on either alternating or direct current. Cuts a 21 inch swath—¼ acre an hour. Automatic friction reel keeps wire always taut and out of the way of the machine and the operator. Mower by Coldwell—Motor by General Electric—Timken Tapered Roller Bearings. Especially useful for small plots, boulevard parkways, etc. To interested executives we will be pleased, upon request, to send complete detailed information or, better still, ask your local Coldwell dealer to show it to you in action.

SINCE 1867

COLDWELL

DEPENDABLE LAWN MOWERS

Hand · Horse · Gasoline · Electric

COLDWELL LAWN MOWER COMPANY, NEWBURGH, N. Y., U. S. A.

ing and training of boy leaders has been made one of the main objectives of every activity, so that many of the older boys are now leading the younger ones in their club work.

A boys' city government, with a city manager, and police, fire, and park departments, gives valuable training in citizenship. The junior police handle petty cases among boys in their wards, after counsel with the city Chief of Police; instruction is given to junior firemen by the Fire Chief; and the junior park board places and cares for bird houses in the city parks and reports to junior police any cases of boys molesting birds.

At the annual hobby show, open to all boys in the city, held on New Year's Day this year, sixty-one boys exhibited their collections of stamps, coins, nature specimens, etc. A bird-house contest was also held which resulted in ninety-eight entries. This bird-house exhibit was then sent to New York City, where it was awarded first prize in the Boys' Club Federation contest.

Through the physical director of the Association, every girl as well as every boy in the local vocational school is receiving physical training and is given an opportunity to take part in team games. Swimming and life-saving classes are held for the boys at the J. E. Hamilton pool. Annual physical examinations are given without charge to every boy participating in the club activities, and the reports of the examining physicians sent to the parents.

Last year three hundred and fifty boys took advantage of the educational and camping tours planned by the Association, on which points of interest in all parts of the state were visited. The cost of these trips was arranged so as to meet each boy's ability to pay, the charges varying from thirty cents to one dollar per day, which included meals and a share of the expense of gasoline for the truck in which the boys traveled. This year a gypsy tour will be made to Niagara Falls. Only eighteen boys will be taken, these being selected according to their standing in the activities of their clubs.

That the combined efforts of our citizens in furthering this comprehensive program of work, of which only a few phases can be covered here, have been fully justified may be seen from the following quotation from a letter received by the Association from the Police Justice of our local court:

"I have checked over the Police Docket of the city of Two Rivers from 1922 to date, and have compared the juvenile cases handled by the local police court for the years prior to the establishment of the Boys' Work Association with the year starting September, 1924, and ending September, 1925. I find that the number of cases reported to the Police Court were 65 per cent less during the period of operation of the Boys' Work Association than they were for the previous years.

"The collection of pistols, revolvers, sling-shots, bicycle and automobile accessories, etc., in the hands of the Police Department has dwindled from what was once a large collection down to a very few items. This is a further evidence of the changed condition that has become effective since the work of the Boys' Work Association commenced."

RICHARD BIEHL,
City Manager.

Activities in "The Hardware City"

NEW BRITAIN, CONN.—The New Britain Chamber of Commerce is working with the American Legion on the project of making a memorial shrine or museum of the home of the most famous of New Britain's sons, Elihu Burritt, the learned blacksmith and apostle of international brotherhood. At the present time, the home, in an alley running off the main street, is in a ramshackle condition. Three committees, divisions of a large committee, are looking into the matter of financing the cost and the use of the museum, should purchase and renovation as a permanent relic be accomplished.

To suggest solutions for local traffic problems, the Chamber of Commerce has recently appointed a committee consisting of four members of the New Britain Chapter of the American Society of Mechanical Engineers, the Chief of Police, a Sergeant of Police, and the Chairman of the Police Commission. This committee is thoroughly investigating the traffic and parking problems of the city and is preparing recommendations to the Ordinance Committee of the Common Council for the solution of these problems.

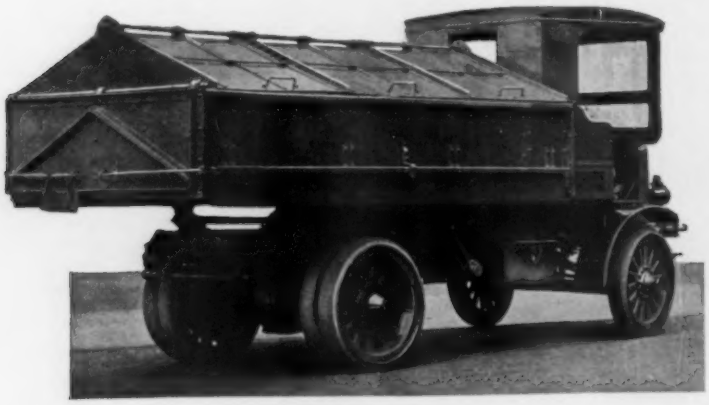
Another recent activity of the New Britain Chamber of Commerce has been the inauguration of a monthly publication called *The Hardware City Magazine*, which serves as a medium of expression for the Chamber and at the same time is a reminder of civic duty to its recipients, members of the Chamber and other subscribers.

Within the past few months the magazine has contained articles by prominent business men, histories of several of the manufacturing companies of the city, news articles on national and local affairs, and other items of general interest to progressive citizens of the community. It has been very well received and the prospect of its financial and editorial success is good.

WILLIAM B. CHRIST,
Assistant Secretary, New Britain Chamber of Commerce.

THERE WERE 98 ENTRIES IN THIS YEAR'S BIRD-HOUSE CONTEST IN TWO RIVERS, WIS.
Prizes amounting to $50 were awarded

Conscience and public opinion enforce the laws; the police suppress the exceptions.
—Arthur Twining Hadley



Autocars have been used by the District of Columbia steadily for 16 years. Every year sees a larger Autocar fleet in service. The truck illustrated is a 4-cylinder 5-ton Autocar equipped with a garbage body.

Direct Factory Branches or Affiliated Representatives in 67 cities

*Albany
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*Charlotte
*Chester
*Chicago
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Columbus
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*Erie
*Fall River
*Fresno
Harrisburg
*Indianapolis
Jacksonville
*Jersey City
*Lawrence
*Los Angeles
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Miami
*Newark
*New Bedford
*New Haven
*New York
*Norfolk
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Orlando
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*Springfield
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Trenton
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West Palm Beach
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Wilkes-Barre
Williamsport
*Wilmington
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York

* Indicates Direct Factory Branch

Watch your hauling costs per truck hour

REMEMBER this—whether your trucks are delivering two tons a day or twenty tons, such cost items as wages, interest and insurance are constant.

By making every 'truck hour' more productive because of short wheelbase handiness each of the thousands of Autocars you see on the streets is cutting the cost of hauling per 'truck hour'.

Watch how quickly the shorter Autocar works its way through crowded traffic. Notice how easily it gets into small, congested places, delivers its load and is off again.

In buying motor trucks it will certainly pay you to check up on this distinctive Autocar advantage by talking to any Autocar owner.

The Autocar Company
ESTABLISHED 1897
Ardmore, Pa.

Autocar

gas *and* electric trucks

EITHER OR BOTH - AS YOUR WORK REQUIRES

When writing to Advertisers please mention THE AMERICAN CITY—Thank you.

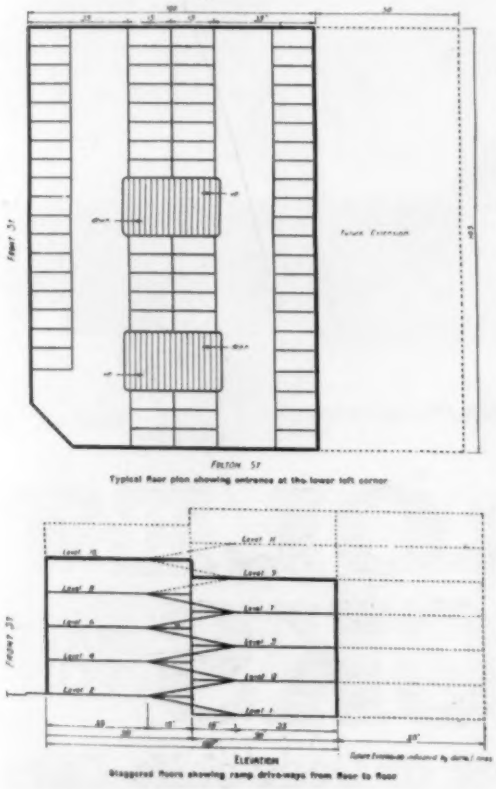
Troy's New Community Garage

TROY, N. Y.—A modern, fireproof d'Humy ramp garage will be built in Troy as the result of a campaign which has just been concluded and which enlisted the cooperation of the Troy Chamber of Commerce, Troy Automobile Club, Troy Rotary Club, Troy Kiwanis Club, Troy Lions Club, the Real Estate Board, the Troy Community Hotel Corporation, the Troy Automobile Dealers' Association, and the Retail and Wholesale Bureaus of the Chamber. From first to last, these organizations have worked together in the spirit of harmony and good fellowship, and this more than anything else contributed to the success of the enterprise.

The campaign objective was $275,000. Stock was sold at one dollar par value in units of two shares of preferred and one share of common stock of no par value, at $201 per unit. The deferred payment plan was adopted, the payments extending over a period of fourteen months, or until June 15, 1927.

In the intensive campaign $195,000 worth of stock was sold. According to the announcement of the Community Garage Executive Committee, it is planned to resort to bonds or a mortgage to furnish the balance of the funds necessary to build the garage and furnish sufficient operating capital. "Troy will get its Community Garage," declared Chairman Charles S. Aldrich of the Executive Committee, and these words are accepted at their face value by the people of Troy, for they know the man who made the statement. The new garage fits into the new program which was begun when the million-dollar hotel proposition was put over eighteen months ago. The Hendrick Hudson will be opened about June 1, and it is expected that the garage will be ready early in the autumn.

G. WRAY LEMON,
Managing Secretary, Troy Chamber of Commerce.



PLANS FOR TROY'S NEW COMMUNITY GARAGE

THE HITCHING-POST PROBLEM IS HERE AGAIN

Salem's Unique Plan for Field Day; Community Music Wagon for Playground Service

SALEM, MASS.—At the close of the summer's activities on the supervised playgrounds of Salem, the children of these recreational centers get together on Field Day to show the results of their training in athletics, dancing, singing games, and stunts. In the picture reproduced herewith may be seen the circular tent, 1,200 feet in circumference, which encloses the circle of 350 feet diameter in which the Field Day exhibition is staged.

A street parade with about 3,500 children and many special features and floats opens the activities of the day, and then performances are given in the field in both the afternoon and the evening. From a bird's-eye view of the field one would think a twelve-ring circus was in action, of which but a small section could possibly be seen by each spectator; but the performance is so planned that those who occupy the same seats during both the afternoon and the evening see the dances and stunts of each playground staged directly in front of them. Each playground group goes through all of its events six times at each performance, the twelve units rotating continuously.

Beneath the shelter of the tent as many as 8,000 spectators can be seated on portable bleachers. An attendance of 20,000 was noted on the Common on Field Day last year. The rear half of the tent, directly behind the bleachers, is devoted to a floral and vegetable display, a children's pet show, a display of 1,200 articles of boys' and girls'

for Economical Transportation

CHEVROLET

These Quality Features found only in Chevrolet for $550 f.o.b. Flint Mich.

Quality Features Typical of the Finest Truck Construction

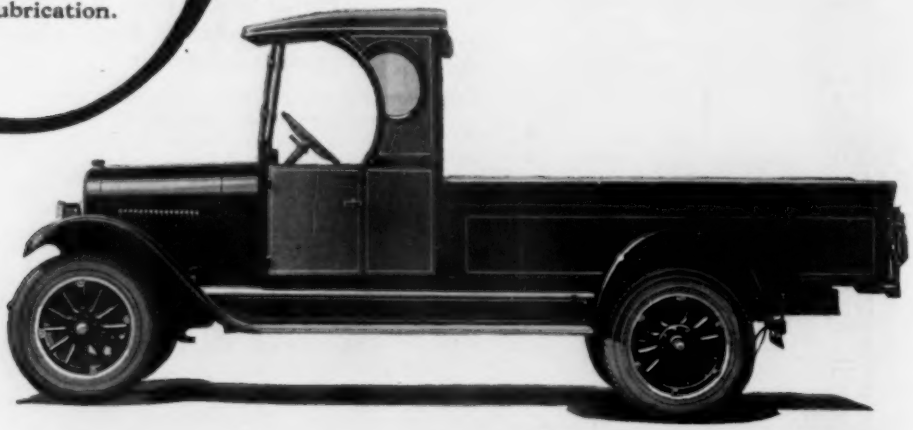
3-speed transmission—disc clutch.
Powerful valve-in-head motor.
Combined pump and splash oiling system.
Extra-large Harrison radiator.
Positive, reliable, semi-reversible steering control.
Extra-large, equalized brakes.
Big, oversize rear axle with spiral cut, bevel gears.
Chrome vanadium steel springs.
Full-length deep channel steel frame.
Alemite lubrication.

With its special truck-type construction—with numerous quality features, found only on higher-priced trucks of equally modern design, this Chevrolet chassis gives definite assurance of dependable delivery plus the vital advantages of low upkeep and slow depreciation.

If your business requires a durable, speedy, thrifty one-ton truck, investigate this rugged Chevrolet model.

CHEVROLET MOTOR CO., DETROIT, MICH.
Division of General Motors Corporation

The 1-Ton Truck

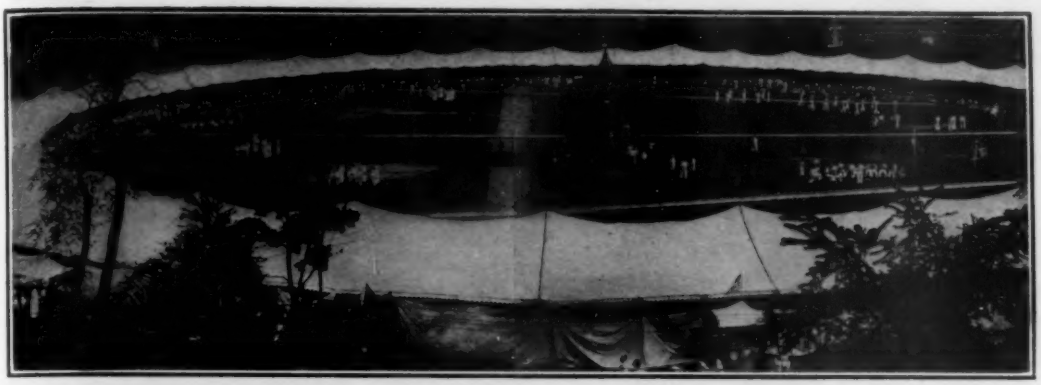


CHEVROLET

ONE TON **TRUCKS** HALF TON

World's Largest Builder of Gear-shift Cars

When writing to Advertisers please mention THE AMERICAN CITY—Thank you.



TENT ENCLOSING THE CIRCLE 350 FEET IN DIAMETER IN WHICH SALEM'S FIELD DAY ROTATING EXHIBITION IS HELD

handicraft, and, in the afternoon, a most interesting baby show. There are ten entrances to the seats and ten to the exhibits, with refreshment booths in charge of volunteer women workers between the entrances around the entire circle. The success of this event is due in a large measure to the efforts of 500 volunteer workers.

The work of the playground dancing department during the past season was made doubly interesting and effective through the use of Salem's community music wagon, which has been supplied by the city to help satisfy the need for music which is apparent on many occasions and in such a variety of places. This wagon is used every day on the playgrounds by the dancing supervisor, who conducts playground sings and singing games in conjunction with her dancing instruction. Many of the playgrounds hold occasional cake and candy sales during the summer months and use the piano for the evening entertainments. Any community enterprise may secure the use of the music wagon by filing application and paying the wages of the driver.

OLIVER G. PRATT,
Superintendent of Parks.

SALEM'S COMMUNITY MUSIC WAGON BRINGS MUSIC WHERE IT IS NEEDED

A New Municipal Obligation

The closed saloons and the ubiquitous automobile have combined to make the need of public comfort stations imperative. This has been recognized in various ways and places, but not in state legislation, with one exception, so far as we know. In 1919 the Wisconsin Legislature passed an act requiring every incorporated city or village to provide and maintain a sufficient number of suitable and adequate comfort stations to serve the needs of both sexes. Under that act 89 cities and 59 villages have 210 comfort stations in use, while two more are under construction, and 27 cities and 14 villages are contemplating the provision of stations. In addition an "incomplete list" shows 426 gasoline filling stations with public toilet facilities, while another such list includes 99 park stations (summer only). Then there are 137 public rest rooms, which presumably serve the same general purpose.

Wisconsin seems to have been in the lead for six years in making the provision of comfort stations a duty incumbent on every incorporated city and village within its limits and, to its credit also, of not leaving the law to execute itself but entrusting its enforcement, in some degree, to its State Board of Health. Other states would do well to consider the Wisconsin statute and its administration. The country-wide lack of comfort stations under sufficient state and municipal control to ensure adequacy in numbers and facilities, sanitation and decency, is a reproach to a civilized people which will increase daily until properly remedied.

—An editorial from the *Engineering News-Record* for April 15, 1926.

For a discussion of the most important factors involved in the location, construction, equipment and maintenance of public comfort stations, by Frank R. King, State Plumbing and Domestic Engineer of the Wisconsin State Board of Health, see THE AMERICAN CITY for December, 1925, pages 613-619.

AMERICANS SHOULD PRODUCE THEIR OWN RUBBER... Harvey S. Firestone

"Maximum Safety and Dependability"

"After having five years' experience with Pneumatics of different makes on our fire apparatus, I do not hesitate to call the attention of those departments considering pneumatic tires for their apparatus to the advantage of the Firestone Gum-Dipped Pneumatic.

"First, the maximum safety and dependability; second, the very low pressure loss while standing in quarters; third, the very low pressure built up in hot weather when called out on long runs. In going into pneumatic tires for fire apparatus I think these three items are very essential for Fire Departments to consider."

Jesse A. Fisher, Chief Annapolis Fire Dept., Annapolis, Md.

Greater Non-Skid protection under all weather conditions is provided by the many specially Firestone designed traction edges and extra depth of tread—giving unfailing service at every speed and utmost driving control on all roads.

The extra Firestone Gum-Dipping process insulates every fiber of every cord with rubber, minimizing destructive friction and building greater security and endurance in these big pneumatics. The special Firestone Steam-Welding process makes Firestone Tubes an endless air-tight unit, adding still further to Firestone safety and dependability.

Your Firestone dealer can give you interesting facts about Firestone economy—see him.

MOST MILES PER DOLLAR

The Mark of Quality

Firestone

HEAVY DUTY PNEUMATICS FOR FIRE APPARATUS

The Regulation of Pedestrian Traffic

Summary of a Progress Report Presented on April 30, 1926, to the National Highway Traffic Association by the Chairman of Its Committee on Regulation of Pedestrian Traffic

By Lewis W. McIntyre

Consulting Engineer and Assistant Professor of Civil Engineering, University of Pittsburgh

1. Regulations adopted should be as few in number as possible.

2. No regulation should be placed on the statute books which cannot or will not be completely and continually enforced.

3. Adequate traffic regulation is expensive. The community should balance the entire cost of sanely planning and sympathetically enforcing a given regulation against the benefits to be derived. If they are unwilling to pay the entire cost, a given regulation had better not be adopted.

4. The majority of contemporary opinion seems to favor some form of pedestrian regulation as a safety measure.

5. The regulation of pedestrians is not at present justified from the standpoint either of expediting pedestrian travel, or of expediting vehicular travel.

6. Since the pedestrian is involved in two-thirds of the traffic accidents involving injury or death, and pedestrian accidents are increasing disproportionately to other types of traffic accidents; since thirty-five per cent of all traffic fatalities are directly caused by some act of the pedestrian, it is imperative that some action be taken to reduce this pedestrian hazard.

7. Forty per cent of the traffic accidents for which the pedestrian is to blame are caused by children playing in the street; and two-thirds of all the child traffic fatalities occur between intersections. These are hazards against which any practical regulation would be almost entirely ineffective. Therefore, there should be carried on in the public schools everywhere a continuous campaign of safety education.

8. Fifty per cent of the traffic accidents for which the pedestrian is to blame are caused by jay-walking or carelessness on his part. Here again a continuous, intelligent, educational campaign seems likely to be the cheapest, most effective, and least irritating measure to adopt, at least at present.

9. It seems wise to recommend that traffic authorities be empowered to select certain intersections which the accident record shows to be particularly hazardous to pedestrians and where the record of the causes of such accidents indicates that regulatory measures will be effective. Here they might be empowered by means of a blanket ordinance to put into effect such simple measures as obedience to the traffic signal, crossing only in the crosswalks, etc.; provided that the number of intersections selected should be limited by the funds available for effective enforcement as indicated in the body of this report.

10. An engineer does not design a bridge without basic

Analysis of Pedestrian Accidents, State of New York, Year 1925

	ACCIDENTS		FATALITIES	
The Pedestrian	Number	Per Cent	Number	Per Cent
Walking, running, or playing in street	12,494	40.60	527	45.20
Crossing at intersections, no signal	5,709	18.50	175	15.00
Crossing, not at intersection	5,331	17.30	208	17.90
Not on roadway	892	2.90	32	2.72
Crossing at intersection, against signal	819	2.66	13	1.11
At work on roadway	783	2.54	29	2.48
Riding or hitching on vehicle	723	2.36	39	3.33
Confused by traffic	619	2.01	20	1.73
Intoxicated	612	1.99	12	1.03
View obstructed	565	1.83	16	1.37
Waiting for, or getting on or off street car; no safety zone	493	1.60	5	.43
Crossing at intersection, with signal	470	1.52	10	.86
Getting on or off other vehicle	307	1.00	18	1.54
Waiting for, getting on or off street car; in safety zone	195	.63	5	.43
Had physical defect	112	.36	5	.43
Standing on safety aisle	70	.22	3	.26
Miscellaneous	25	.08	2	.18
Not known	22	.07	...	...
Not stated	570	1.83	47	4.00
Total	30,811	100.00	1,166	100.00

. . . and you can be sure of these things—

WHEN the road engineer specifies Tarvia he can be sure of these things:

—that the Tarvia will be unvarying in quality (This is assured by strict laboratory control);

—that delivery will be made when and how specified;

—that he will have at his disposal efficient equipment which will reduce his expense to a minimum; and

—that he can rely upon intelligent advice and unobstructive cooperation from a trained Tarvia field man.

So complete a service insures success in your highway undertaking.

Tarvia
For Road Construction Repair and Maintenance

New York, St. Louis, Detroit, Minneapolis, Youngstown, Baltimore, Chicago, Cleveland, Kansas City, Salt Lake City, Milwaukee, Syracuse

The Barrett Company

Providence, Buffalo, Philadelphia, Cincinnati, Birmingham, Bethlehem, Toledo, New Orleans, Boston, Pittsburgh, Dallas, Lebanon, Columbus, Rochester

In Canada:

THE BARRETT COMPANY, Limited: Montreal, Toronto, Winnipeg, Vancouver

engineering data upon which to work. Neither can effective traffic regulation nor accident reduction measures be planned without adequate underlying data concerning causes of accidents. It is the first duty of those in charge of traffic control to secure such data. In its absence a community will only get changing, irritable, and ineffective measures.

11. Adequate enforcement of traffic regulations is not secured by short-period drives for the enforcement of one particular regulation to the complete neglect of others. These regulations which are in the discard for long periods of time become almost completely ineffective, and the result of such procedure is to build up in the mind of the public a willingness to disobey all law if they "can get away with it."

12. Educational measures should be given more prominence, and more money should be spent on them. They should be continuous instead of spasmodic. They should aim to tell the public the "why" of traffic regulatory measures. If a measure is designed to prevent accidents at a certain point, the educational campaign should show the public the accident figures on which the need for the measure is based. Such educational efforts must be unceasing.

Synopsis of Los Angeles and New Orleans Traffic Ordinances for Pedestrian Protection and Regulation

LOS ANGELES

Safety Zones.—Pedestrians have exclusive use of safety zones. Vehicles must never enter them.

Crosswalks.—Pedestrians have right of way in crosswalks. When a pedestrian signals by holding hand palm toward traffic, drivers must not enter crosswalks until pedestrian has passed.

School Crossings.—Drivers are forbidden to enter yellow marked school crossings when the section to their side of the street is occupied by pedestrians.

Pedestrian Control.—Pedestrians must obey traffic signals. In the Central Traffic District they may cross roadways only at crosswalks and elsewhere only by the most direct route. They may not walk in the roadways if such action interferes with the movement of vehicles or street cars.

Sidewalks.—Pedestrians when stopped on sidewalks must stand near the building or curb line.

NEW ORLEANS

Regulations.—The road-beds of highways and streets are primarily intended for the use of vehicles, but pedestrians have the right to cross them. By observing the following rules pedestrians will facilitate the movement of traffic and minimize the danger to themselves.

1. *Must obey traffic signals.*—Pedestrians are required to comply with signs, semaphores, whistles, and other traffic signals. Pedestrians may signal intention to cross street. When given this warning, approaching vehicles shall come to a stop and give pedestrians right of way.

2. *Have right of way at intersections.*—At street intersections not under police signal control, pedestrians shall have right of way over vehicles, provided pedestrians shall give warning of their intention to cross the street by holding up their hand in a manner to be plainly seen. This shall not entitle the pedestrian to enter or cross the intersections regardless of approaching traffic, but shall be interpreted to require vehicles to change their course, slow up, or stop to permit pedestrians to negotiate the crossing with safety.

3. *Vehicular right of way.*—Vehicles shall have right of way over pedestrians between street intersections.

4. *Jay-walking prohibited.*—Pedestrians shall cross streets only at right angles, and at street intersections, and shall not cross street intersections diagonally.

5. *Keep to right on sidewalks.*—Pedestrians shall keep to the right on sidewalks.

6. *Do not stand in the street.*—Pedestrians shall not remain standing on the street except in safety zone, and shall not stop or loiter on a street crossing.

7. *Look before entering street.*—(a) Pedestrians should look before stepping from the curb, first to the left, then to the right for vehicles. (b) Pedestrians shall not step into that portion of the street open to the moving traffic at any point between intersections where their presence would be obscured from the vision of approaching traffic by a vehicle or other obstruction from the curb, except to board a street car, or to enter a safety zone, at right angles. (c) When alighting from street cars, pedestrians should be sure the way is clear before crossing behind the car.

8. *Wait on sidewalk.*—Persons waiting for street cars shall not step into the street sooner, nor on leaving a car remain in the street longer, than is necessary.

9. *Hooking on vehicles.*—No person riding on bicycles, roller-skates, coasters, or other vehicles propelled by feet shall attach themselves to moving vehicles on public thoroughfares.

EDITORIAL NOTE.—Readers of THE AMERICAN CITY will find available upon application to the Department of Public Safety, New Orleans, La., a pamphlet of 90 pages, pocket size, giving the ordinances governing traffic in that city, corrected to December 1, 1925. The pamphlet is illustrated with a map of the business section of the city and with various diagrams explaining the rules of the road, the signals, and how to test headlights.

A recent report from Captain Eugene Casey, Traffic Supervisor, to Superintendent of Police Thomas Healy, of New Orleans, states that while the ordinance for the regulation of pedestrian traffic is possible of enforcement only at intersections where there are a sufficient number of traffic officers, it distinctly places the responsibility for an accident on the pedestrian who is moving on the wrong signal.

The G-Boy

Scores a Genuine Triumph

The enthusiastic welcome given the G-Boy, Graham Brothers new one-ton truck, has established this fact:

It is recognized at once as a real—a major—contribution to commercial haulage.

Revolutionary improvement in balance effected by a new system of weight distribution, compact wheel base, ease of handling, generous body capacity, advantages of the ever dependable and always economical Dodge Brothers engine—all these important factors enter into the G-BOY'S marked success.

And then the price! So low that only Graham Brothers, the largest exclusive truck makers, with huge buying and building capacity, could possibly achieve it.

GRAHAM BROTHERS
Evansville—DETROIT—Stockton
A DIVISION OF DODGE BROTHERS, INC.
GRAHAM BROTHERS (CANADA) LIMITED—TORONTO, ONTARIO

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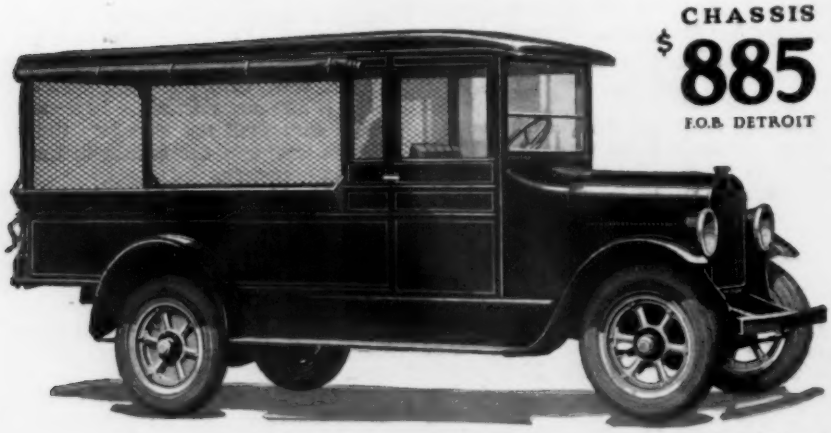


GRAHAM BROTHERS TRUCKS

SOLD BY DODGE BROTHERS DEALERS EVERYWHERE

An Interesting New Type of Water-Main

By Charles Haydock

A NEW type of water-main has been developed in Italy and has been proved successful by ten years of actual service. This interesting pipe is made of a mixture of 85 per cent cement and 15 per cent asbestos, and on a cylinder paper machine. Being composed of materials that do not rust nor corrode, it does not require coating and is practically indestructible. Its carrying capacity is said not to decrease with age as is frequently the case with cast iron or steel.

Process of Manufacture

In the manufacture of asbestos shingles by the Hatchek process or in making paper, the raw materials are fed into beaters where they are thoroughly mixed. This mixture then goes to the agitators for further mixing with an excess of mixing water. From the agitators, it goes to the feed-box of the cylinder machine. An endless belt, moving through the machine, picks up a thin layer of the mixture, which is carried over the several cylinders, usually four, and taken off the belt by the accumulator cylinder.

Asbestos shingles are actually made as cylinders. The only differences between making shingles and pressure pipes are in the size and length of the accumulator cylinders and in the treatment of the product after the desired thickness has been obtained.

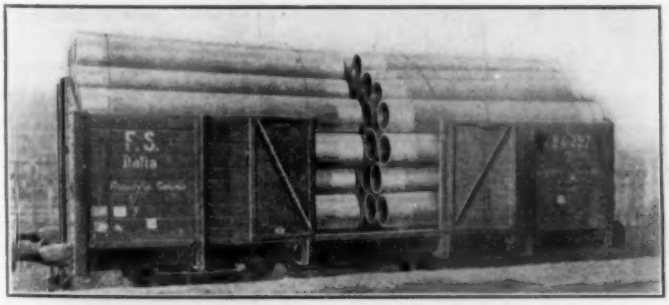
Shingles are made on a cylinder about 32 inches in diameter and 50 inches long, so that the stock when cut, removed from the cylinder and straightened out is 4 x 8 feet. The pipe is made on a mandrel to finish to 4-meter lengths, about 13 feet, and the outside diameter of this mandrel is substantially the same as the desired internal diameter of the pipe. When the desired pipe thickness is obtained, the pipe is removed to another mandrel, on which it remains until hardened, about three or four days. After twenty-eight days of air and water curing, the pipe is ready for shipment.

The interior of the finished pipe is perfectly smooth and gives a very high coefficient of discharge, said to be about 15 per cent more than the commonly accepted coefficient of hot coal tar pitch dipped cast iron pipe. It will withstand the American Water Works Association hydrostatic pressure test of 300 pounds. The tensile strength is about 1,800 pounds per square inch, this high figure unquestionably being due to the method of manufacture.

The ends of the pipe as it comes from the machine are necessarily not smooth, and when the pipe is removed from the mandrel it is squared off, using a saw. Even after thoroughly hardening and seasoning, the pipe can still be sawed, a property that necessarily simplifies installation and maintenance.

The weight of the pipe is about one-third of that of cast iron for 100 pounds working pressure. It has been used abroad extensively, but has not been used in this country as yet, although it is being considered on several large projects.

As compared with cast iron, the advantages claimed for Italit pipe are as follows: first cost equal to or lower than the cost of cast iron; weight much less than the weight of cast iron, resulting in lower freight, distributing and laying costs; the carrying capacity is materially greater than that of cast iron pipe for the same internal diameter, and this capacity will not decrease as in the case of cast iron or steel, on account of tuberculation; being of non-conducting material, the pipe is not subject to electrolytic corrosion.



AN ITALIAN FREIGHT CAR LOADED WITH ITALIT PIPE

Use in Europe

Foreign practice in using this pipe differs from American practice in using cast iron, in two important features. Italit pipe is made with plain ends, and a bolted sleeve joint with rubber packing rings is used to make the joints watertight. If an indestructible

Budd-Michelin

Dual Wheels are the peacemakers of motor transportation

•

WITH Budd-Michelin Dual Wheels between the truck and the road there are fewer complaints from both.

Nothing calms a ruffled road like these dual cushions of air. Nothing keeps a truck in better humor. They cushion the truck from the shocks of rough roads. They mean fewer repair bills, speed with safety, and a longer life for the truck.

Budd-Michelin Dual Wheels mean regular-size pneumatics but *over-size* mileage—15,000 to 20,000 miles from every set of tires! That's the average on over 40,000 heavy buses.

Now truck owners are equipping their heavy trucks from two tons up, with Budd-Michelin Duals. They're making longer hauls in shorter time, more deliveries, using fewer trucks, and paying lower maintenance costs.

Budd-Michelin Dual Wheels have made the heavy truck a more economical means of transportation. They have increased its usefulness and brought it a greater measure of public approval.

They can be had on any make of truck, and any truck can be converted. Ask any dealer—or write us.

BUDD
WHEEL COMPANY
Detroit

The Budd-Michelin equipment—two Budd-Michelin single wheels in front, two Budd-Michelin Dual Wheels in the rear (pairs of single wheels acting together as units.) All wheels completely interchangeable either as units or as halves of Duals. One spare.

gasket is used, there is no serious objection to this sleeve-type joint, except that it is not ordinarily used in this country, although it is used very extensively abroad.

The other important variation from American practice is in the method of tapping. Foreign practice is to tap Italit pipe through a saddle bolted on the pipe. This slightly increases the cost of making a tap, but is not particularly objectionable otherwise. Standard valves and specials are used, being connected to the Italit pipe by means of adaptor pieces.

The method of manufacturing is such as to produce a homogeneous product, and as any required wall thickness can be obtained, it is possible to make this pipe for any desired pressure.

In addition to being used for high-pressure water systems, Italit pipe has been successfully used for conveying chemicals which would attack iron or steel pipe as sheathing to protect other pipes, for sewer pipe, gas, oil, and compressed air lines, anl for downspouting. It is made in sizes from 2 to 32 inches in diameter.

The pipe is made by the Eternit Pietra Artificiale at their factory near Genoa, Italy. The company is represented in the United States by C. J. Stover of 246 North 17th Street, Philadelphia, Pa., from whom part of the foregoing information was obtained. W. R. Conard, of Conard & Buzby, Burlington, N. J., collaborated with the writer in making the investigation on which the description is based.

Chicago Will Celebrate Its Centennial

PLANS for a celebration of the 100th anniversary of the incorporation of Chicago, that will be not just a vast industrial exposition but a powerful testimonial to the growing art, culture, and education of the city, were set in motion at the first meeting of the Chicago Centennial Commission recently.

This Commission, which was appointed by Mayor Dever at the request of the City Council, is made up of about two hundred leading citizens, including representatives of the professions, industry, women's organizations, art and education. The Mayor was elected temporary chairman, and Myron E. Adams, who, as pointed out by the Mayor, was the first to suggest the centennial celebration, was elected temporary secretary. A motion was made that the Mayor be elected as permanent chairman, but this honor was declined, the Mayor expressing his belief that it would be preferable to appoint to this office someone not in any way connected with official life.

In his address opening the session, the Mayor emphasized the hope that the centennial celebration, whatever form it took, would be of lasting benefit to the city. He stressed particularly that the buildings constructed would be of permanent type, and suggested the lake front, where vast improvements are now under way, as an ideal location for the center of the exposition. "Great things are pending in Chicago," he said. "The centennial date when it is set, will be an impetus to those developments. Working together, we shall try to reach a definite goal of physical progress by the opening of the anniversary."

To get the plans under way as promptly and efficiently as possible, a Ways and Means Committee of thirty-five prominent Chicagoans has been appointed by Mayor Dever, as follows:

W. Rufus Abbott, President, Illinois Bell Telephone Company
Capt. Myron E. Adams, Fort Sheridan Association
Julius T. Benedict
Britton I. Budd, Chicago Rapid Transit Company
Francis X. Busch, Corporation Counsel
E. F. Carry, President, Pullman Company
Anton J. Cermak, President, Board of County Commissioners
Dorsey R. Crowe, Alderman
Gen. Abel Davis, Vice-President, Chicago Title & Trust Company
Rufus C. Dawes, President, Commercial Club
William R. Dawes, President, Association of Commerce
Joseph H. De Frees, lawyer
James E. Gorman, President, Chicago Rock Island & Pacific Railway
E. N. Hurley, Ex-Chairman, U. S. Shipping Board
Mrs. Harold L. Ickes, President, Chicago Woman's Club
D. F. Kelly, President, The Fair
E. J. Kelly, President, South Park Commissioners
Albert D. Lasker, President, Lord & Thomas
Charles H. Markham, President, Illinois Central Railway
Mrs. Catherine Waugh McCulloch, McCulloch & McCulloch
Miss Agnes Nestor, President, Chicago Women's Trade Union League
Victor A. Olander, State Federation of Labor
John W. O'Leary, Chicago Trust Company
Augustus S. Peabody, Peabody, Houghteling & Co.
Alexander H. Revell, Alexander H. Revell & Co.
Theodore W. Robinson, Vice-President, Illinois Steel Company
Leasing Rosenthal, Rosenthal, Hamill & Wormser
James Simpson, President, Marshall Field & Co.
Dr. Otto L. Schmidt, President, Chicago Historical Society
Julius F. Smietanka, President, Union State Bank of Chicago
Col. Albert A. Sprague, Commissioner of Public Works
Arthur W. Straus, Vice-President, A. W. Straus & Co.
L. F. Swift, President, Swift & Co.
Melvin A. Traylor, President, First National Bank
Harry A. Wheeler, President, Union Trust Company

Two dates are under consideration for the centennial celebration—1933, the anniversary of the incorporation of Chicago as a village, and 1937, commemorating its advance to the rank of a city. It is probable that the earlier date will be adopted and quick action taken on permanent organization.

Aviation Fields Exempted from Taxation

AN amendment to subdivision 23 of Section 4 of the tax law of New York State, approved April 29, 1926, provides that real property of a municipal corporation not within the corporation when used for a public aviation field shall be exempt from taxation.

This measure was advocated and supported by The Merchants' Association of New York in the belief that its enactment would give a needed stimulus to the development of public airports in the larger cities of the state.

CITY OF
ROCK ISLAND
ILLINOIS

"IN THE HEART OF EVERYTHING"

W. A. ROSENFIELD
Mayor

Sept. 25, 1925.

The King Company,
Chicago, Illinois.

Gentlemen:-

The King posts installed by the City of Rock Island in the new "Whiteway" system have given us wonderful satisfaction and the type selected has met with the approval of not only our own citizens, but visitors. The posts were selected by a committee of property owners and the Board of Local Improvements adopted them by unanimous vote.

Rock Island, as you may know, is the first city in this part of the country to adopt a new Whiteway Lighting System and our sister cities are now following our example. Rock Island's business district is the best lighted in the country.

I am writing this letter to let you know how pleased we are with the new system, which includes the King Posts.

Yours very truly,
W. A. Rosenfield, Mayor

WAR-M

FOR SUPER-STRENGTH
KING

In

Rock Island

the action of the Committee of Property Owners and Board of Local Improvements in selecting King Standards was in recognition of their qualities of beautiful design, long-life usefulness and low-cost maintenance.

Your City, Too, Can Have Well-Lighted Streets

Write today for the complete information you will find in *free* Design Book No. 100

KING COMPANY

The World's Foremost Manufacturer of Street Lighting Standards

230 South Clark Street Chicago, Ill.

When writing to Advertisers please mention THE AMERICAN CITY—Thank you.

Another Year of Nation-wide Progress in Community Recreation

Significant Statistics Gathered by the Playground and Recreation Association of America

ANOTHER year of progress in the playground movement is shown in the reports from 748 cities maintaining community recreation programs under leadership, published in the Year Book number of *The Playground*, issue of April, 1926. This compilation of statistics is illustrated with several charts, two of which are here reproduced. Summaries of some of the statistics follow:

Cities reporting play areas under leadership	748
Total number of workers employed	17,177
Total number of play leaders working without pay	6,799
Total number of separate play spaces reported	8,608
Indoor recreation centers	1,613
Ball fields	2,831
Tennis courts	6,110
Swimming pools	879
Bathing beaches	273
Summer camps under recreation systems	200
Municipal golf courses	153
Skating places	1,217
New play areas opened in 1925 for the first time	654
Number of cities in which land or property was donated for recreation during 1925	83
Approximate number of cities and towns over 8,000 population not reporting a single playground	362

Management of Recreation Facilities

The forms of municipal administration in the cities sending complete reports are summarized as follows:

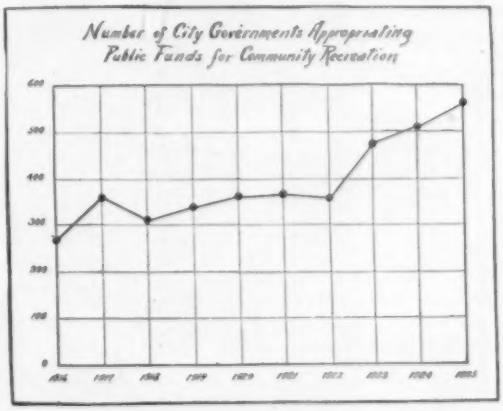
Managing Authority	No. of Cities
Playground and Recreation Commissions, Departments, Divisions, Boards or Bureaus	174
Boards of Education	113
Park Boards, Commissions, Departments and Bureaus, or Park and Recreation Commissions	111
City Councils	17
Departments or Boards of Public Works	10
Departments of Public Welfare	5
Welfare and Recreation Commissions	2
Departments of Public Utilities	2
Bath-House Commissions	2
City Planning Commissions	1
Shade Tree Commissions	1
	438

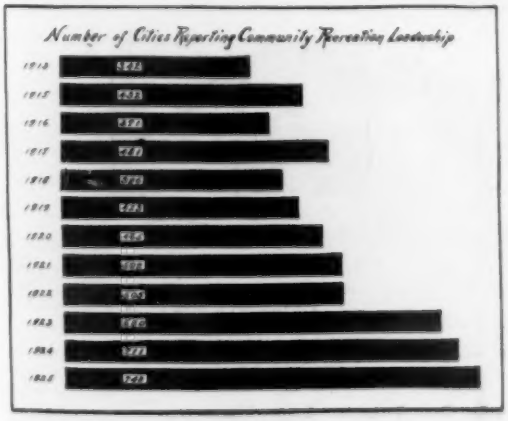
In a number of cities municipal departments combined in the management of playgrounds and community centers, as follows:

Managing Authority	No. of Cities
Board of Education and Park Board	8
Recreation Department and Board of Education	6
City and Board of Education	5
Recreation Department and Park Board	2
	21

Private organizations maintaining playgrounds, recreation centers, or community recreation activities are reported as follows:

Managing Authority	No. of Cities
Playground and Recreation Associations, Leagues, Committees and Societies, Community Service Boards, Associations and Bureaus	175
Civic, Welfare and Improvement Leagues, Associations and Clubs	34
Women's Clubs	13
Rotary, Kiwanis and Lions Clubs	23
Industrial Plants	11
Parent Teacher Associations	9
Y. M. C. A.	7
Boards of Missions and Church Societies	4
Athletic Associations	3
Boys' Clubs	2
Chambers of Commerce	2
Girls' Clubs and Councils	2
American Red Cross	1
Individuals	1
	278





Finances

The sources of support for community recreation activities in the 748 cities appearing in the Year Book table are summarized as follows:

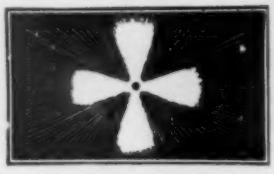
Source of Support	No. of Cities
Municipal funds	362
Private funds	178
Municipal and private funds	191
County funds	4
State, municipal, and county funds	1
State, municipal, and private funds	2
County and private funds	10
	748

A large increase is found in the number of cities voting bonds for recreation purposes in 1925.

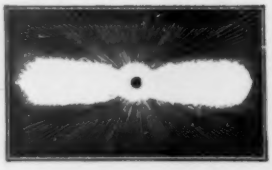
HOLOPHANE

Asymmetric Street Lighting

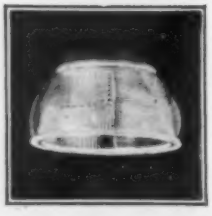
4-WAY REFRACTOR—For use over the center of street intersection.



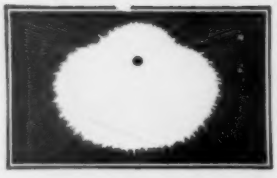
2-WAY REFRACTOR—For use between intersections when blocks are long.



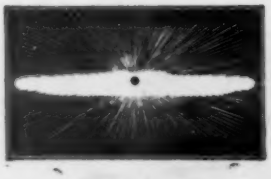
BILUX REFRACTOR—For use in ornamental units.



ASYMMETRIC DOME REFRACTOR—For use in ornamental units.



HIGHWAY REFRACTOR—For lighting highways.



THE HOLOPHANE COMPANY

NEW YORK AND TORONTO

HOLOPHANE DIRECTS LIGHT SCIENTIFICALLY

Fifty-two cities report bond issues totaling $7,426,853.

That public-spirited citizens are recognizing the community value of land or property devoted to recreation purposes is evidenced by the increasing number of gifts reported from year to year. Eighty-three cities report land or property donated during 1925, as compared with 65 cities reporting in 1924. Sixteen cities report loans of property for recreation purposes.

Special Recreation Activities

The organization of leagues in connection with community recreation activities is reported as follows: (*The figures in parentheses indicate the number of cities reporting in each case.*)

	Leagues	Teams	Players
Baseball	1,301 (413)	8,981 (385)	161,758 (319)
Playground ball	1,243 (249)	8,399 (231)	103,538 (187)
Football	247 (126)	949 (107)	55,870 (86)
Soccer	236 (109)	1,667 (100)	37,790 (87)
Basketball	913 (264)	5,934 (240)	63,516 (201)
Quoits	452 (167)	2,692 (134)	63,043 (126)
Volley-ball	703 (267)	3,834 (242)	35,685 (195)
Bowling	124 (61)	844 (52)	6,136 (44)
Miscellaneous	962 (103)	3,964 (84)	57,707 (83)

Other special recreation activities reported by the various cities include:

Badge tests	160	Domestic science	112
Community singing	246	Gardening	73
Bands	165	Art activities	177
Orchestras	135	Craftsmanship	265
Music memory contests	67	Junior police	83
Toy symphonies	53	Self-government	76
Pageants	240	Athletics for industrial groups	207
Dramatics	256	Winter sports	199
Holiday celebrations	296	Organized hiking	295
Block parties	53	Marble tournaments	177
Motion pictures	163	Horse-shoe tournaments	287
Citizenship activities	124	Forums	38
First aid classes	160		

Lists and Statistical Tables

In addition to the foregoing and other data of value to recreation departments, the Year Book number of *The Playground* contains a list of officers of recreation, commissions, boards and associations, and tables of playground and community recreation statistics for the 748 cities reporting. Copies of this issue can be secured for 50 cents each from the Playground and Recreation Association of America, 315 Fourth Avenue, New York City.

Should Police Departments Have Exclusive Control of Street Traffic?

A DISCUSSION of the problem, which is puzzling so many cities, of the most effective organization for the planning and administration of street traffic control, is a feature of a report submitted in January to Mayor Frank X. Schwab of Buffalo by W. B. Powell, traffic engineer. Mr. Powell, who has been serving for a year past as engineering advisor to the Chief of Police of Buffalo, offers the following recommendations for more effective coordination of traffic work in that city:

Police Department Organization

The present organization of those divisions of the Police Department which come in contact with the traffic situation are not as closely coordinated as they should be for the most effective work. As now constituted, these forces comprise the following groups, each reporting independently to the Chief of Police:

A. Motorcycle squad, 23 men commanded by a Captain

B. Traffic squad, 76 men and 3 lieutenants commanded by a lieutenant designated as "Chief of Traffic"

C. Horse-mounted squad, 30 men commanded by a lieutenant

D. Record Bureau, 4 men under direction of Chief Desk Lieutenant

E. Electric Signal Bureau under direction of Chief Electrician

The result of this form of organization is that the Chief of Police is in effect the actual director of traffic, since he is the common source of authority under which all these forces must act. However, his other duties are of such importance and varied character that he cannot give the amount of attention to traffic plans and regulation that the situation demands. Consequently, plans are proposed and executed by the commanding officers of each group independently, with the confusion and overlapping of authority which naturally would result from such an arrangement.

Furthermore, the planning of traffic regulations is now recognized as distinctly an engineering problem, which regular police officers have neither the time nor the technical training to handle with the greatest efficiency. There should be added to the force a consulting engineer whose duty it shall be to scrutinize and approve all plans for changes in traffic control, but who shall have no authority of administration.

The administration of traffic regulations by the three groups A, B and C should be coordinated by placing them all under the direct command of an inspector or a captain, who will report direct to the Chief of Police, but who will relieve him of all details of coordinated administration. In this connection, a traffic school should be established for all men of the department, so that uniform methods of traffic control may be employed throughout the city.

In addition, the motorcycle squad should be greatly enlarged and should be equipped not only with additional motorcycles, but also with a considerable number of small standard automobiles, which are more effective then motorcycles in detecting many forms of traffic violations. There should be organized within the motorcycle squad a small group of trained men to investigate all serious accidents immediately, equipped with cameras and measuring instruments, so that first-hand expert information may be obtained as to causes and responsibility.

EDITORIAL NOTE.—Buffalo's new Chief of Police, James W. Higgins, as one of his first official acts after taking office on January 1, has put the foregoing recommendations into effect to the extent of designating Capt. Joseph Godfrey to command all three of the active squads, A, B and C. The AMERICAN CITY will welcome comments on the question of coordinating the police and engineering features of traffic control, from any official who feels that the problem has been satisfactorily solved in his city.

Right over the old brick!

Before Conant Street, Maumee, Ohio, shown above, was paved with Trinidad Native-Lake Asphalt in 1923, it was a considerably-the-worse-for-wear brick street. Resurfacing with Trinidad transformed it into a substantial thoroughfare which has stood traffic for 3 years—and will stand it for ten times that long, judged by hundreds of other Trinidad Lake Asphalt pavements.

Old brick, concrete, macadam, and stone streets can be resurfaced with Trinidad Lake Asphalt at *half the usual cost*—and Trinidad is long lasting and low in maintenance cost.

For road building, Bermudez Road Asphalt has proved its merit Interesting data on request.

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The City's Legal Rights and Duties

Conducted by A. L. H. Street, Attorney at Law

Chicago Speed Ordinance Held to Be Void as Inconsistent with State Law

The Illinois state law makes it prima facie negligent to drive a motor vehicle faster than ten miles per hour in closely built-up city sections, or faster than fifteen miles an hour in residential districts, or faster than twenty miles an hour outside such sections and districts. The city of Chicago adopted an ordinance containing a prohibition against driving motor vehicles faster than ten miles an hour across streets on which street cars are operated. Declaring the provision to be void, the Illinois Supreme Court said in the case of Hoigard vs. Yellow Cab Company, 150 Northeastern Reporter, 911:

"The rate of speed is inconsistent with the provisions of the Motor Vehicle Act, for, while the limitation is not less than that which the act declares prima facie evidence of an unreasonable rate of speed through the closely built-up business portions of the city, the ordinance applies to all streets throughout the city on which street cars are operated, and its application is not controlled by traffic conditions at the intersections but the ordinance applies to all intersections, regardless of the amount or character of the traffic. The mere existence of a street-car track, without any reference to the kind or amount of the traffic, makes the ordinance applicable, however sparse may be the population of the district, or however light may be the traffic on the street."

County May Contribute to Cost of Construction of State Thoroughfare

That a highway constitutes a state thoroughfare does not preclude a contribution to its cost by political subdivisions through which it extends, holds the Florida Supreme Court in the recent case of Lewis vs. Leon County, 107 Southern Reporter, 146.

In that case a county bond issue was unsuccessfully assailed on the ground that the roads to be improved were state trunk highways. The Court said:

"Whether the road be called a state road or a county road, it is open to the use of the general public, both of the county and the state, and its benefits flow to both the county and the state. It may be a state road, both in name and in ownership, but as to that portion which passes through a particular county it is also to all intents and purposes, and in its beneficent effect, a county road as well. In substance and effect, such through or trunk-line highways are not exclusively state highways. . . . Whether the county or the state constructs or owns or maintains any given portion of a through highway, connecting neighborhoods, villages, and towns within the county, as well as counties and cities beyond its boundaries, and facilitating travel, transport and intercommunication between them, the use is the same, and the benefits are the same"

Mere Illegality of a Municipal Act Will Not Support a Taxpayer's Suit

Unless there was detriment to a city or its taxpayers in selling water from the municipal waterworks to consumers outside the city limits, a taxpayer had no standing to restrain such sale, held the New York Court of Appeals in the case of Western New York Water Company vs. City of Buffalo, 151 Northeastern Reporter, 207. The Court remarked:

"Mere illegality is not enough. The very nature and purpose of a taxpayer's action, like the present one, presume that there will be more than illegality to enable him to intervene. The basic theory of such an action is that the illegal action is in some way injurious to municipal and public interests, and that, if permitted to continue, it will in some manner result in increased burdens upon, and dangers and disadvantages to, the municipality and to the interests represented by it and so to those taxpayers. . . . There are other penalties than a taxpayer's action for those municipal officers who disregard their responsibilities and transgress their limitations."

Public Utility May Be Required to Meet New Needs

In the case of Village of Massena vs. St. Lawrence Water Company, 214 New York Supplement, 113, the defendant unsuccessfully resisted proceedings to compel it to extend its mains, on the ground that the street along which the extension was demanded was not in existence when the company obtained its franchise. The Supreme Court for St. Lawrence County, New York, said:

"To say that it is not bound to furnish its service to streets that were not then in existence is just as reasonable, in my judgment, as to say that it should not provide such service to persons who were not then living. A grant of authority to use the streets of a municipality for the purpose of conducting water, without any express limitation, should not be restricted to existing streets and highways, but should be construed so as to include streets subsequently enlarged, changed, or opened. A franchise for supplying water not only confers a privilege, but imposes an obligation, upon the defendant to serve the public in a reasonable way."

It was further decided that any inadequacy in existing water-rates was no defense to the proceeding to compel extension of the mains. If the rates are inadequate, the company has a legal remedy to secure reasonable compensation for the service rendered.

Power and Speed insure greater Work Capacity

GMC TRUCKS
PRODUCT OF GENERAL MOTORS

In the purchase of a motor-truck, *Work Capacity* will be considered first. Your truck must be powerful enough to handle its loads on the steep hills and in heavy going, without sacrificing the speed that governs its earnings.

Every GMC model; from the 1 ton to the 15 ton Big Brute Tractor-Truck; is powered with an engine of greater than average capacity. Yet GMC full pressure lubrication and the dual cooling system make speed possible and safe.

In the Big Brute heavy duty models, tremendous reserve power is provided through the GMC 53 horse power Engine and the famous GMC Two-Range Transmission, without uneconomical "over-powering" or sacrificing one iota of speed.

The engineering and manufacturing standards attained by General Motors make this exceptional GMC work capacity possible—*with economy.*

The Superintendent of Machinery of the Paving Department of Minneapolis, has the following to say: "Have 4 GMCs, one ran three years before the first overhaul, being out of service only three days in the four years. Total repairs on the four trucks during four years has not exceeded $400."

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GENERAL MOTORS TRUCK COMPANY, Pontiac, Michigan

A DIVISON OF YELLOW TRUCK AND COACH MANUFACTURING COMPANY

GMC 1, 1½ and 2½ ton trucks — GMC Big Brute 3½ and 5 ton trucks
GMC Big Brute 4 to 15 ton Tractor Trucks — Yellow Light Delivery Trucks
Co. GMT Co—1926 — Yellow Cabs — Yellow Coaches — Hertz Drivurself Cars

A Railway Anti-Smoke Ordinance Declared to Be Void as Being Too Drastic

An ordinance adopted by the city of Buffalo required railways operating locomotives within the city to file by a certain time plans to abolish steam as power, and make it unlawful one year thereafter to operate within the city engines emitting "smoke or steam." This ordinance was held by the New York Supreme Court to be unconstitutional for unreasonableness and interference with interstate commerce. (City of Buffalo vs. New York Central Railroad Company, 212 New York Supplement, 1.) The Court said, after an extended discussion of municipal powers:

"The ordinance is not only unreasonable but impossible. It was stated upon the argument, and not denied, that defendant operated over 200 trains a day of one kind or another in the city of Buffalo. . . . A penalty of $250 for each one, assessed against the defendant, and a like penalty against each servant in charge of such trains, such penalties being reassessed every day, create a situation where defendant can, in a real sense, be said to have been denied the equal protection of the law granted to criminals even, as well as to public service corporations upon whose continued existence the very life of commerce and the prosperity of the nation depend. The defendant is threatened with annihilation for having the temerity to resist this ordinance and test its validity. The penalties accumulated since the case was argued stagger the imagination. The situation constitutes a denial to defendant of the equal protection of the law. . . .

"Whether or not it is good public policy to enact and enforce such an ordinance as the one here involved is a matter for the wisdom of the city government rather than for regulation by the courts. The many millions of dollars that the defendant would have to spend to obey the ordinance would sooner or later have to be collected from the public served by the defendant. That is not a matter which interests us here: but, for reasons above stated, the ordinance seems to me to be grossly unreasonable, and therefore unconstitutional, as well as an unauthorized interference with interstate commerce."

Where Fee Title to Bed of Street Is Not Owned by City, It Has No Right to Construct a Comfort Station Under Such Street

Where a city does not own the fee simple title to land used for street purposes, an abutting property owner may enjoin use of the strip for other than purpose of travel, etc., according to the decision of the Washington Supreme Court in the case of Motorramp Garage Company vs. City of Tacoma, 241 Pacific Reporter, 16. The opinion says:

"There can be no question that the dedication of the street for a public highway would not allow the municipality to interfere with the access and ingress to the abutting lot, and it might be that the lot owner could maintain the action, even though the interference was not actual at the time the suit was begun, but was potential, in that it might occur when the lot owner was seeking to use his property in a different manner from that which he was exercising at the time the suit was brought. . . . It is not everything that is conducive to public health, comfort, and convenience which justifies a municipality in making use of its streets, the fee of which is in private individuals, for the purpose of protecting that health, adding to that comfort, or increasing that convenience."

Municipal Property May Not Be Donated for Private Benefit

Setting aside a conveyance of land by a village to a manufacturing company, the Wisconsin Supreme Court said in the case of Village of Suring vs. Suring State Bank, 207 Northwestern Reporter, 944:

"Some claim is made that, if the village had power to acquire the property in question, it also had power to convey. If it be assumed that the village had power to convey in a proper case, that would not justify a conveyance in this case which was by way of gift of the property to private parties for private benefit. A municipality cannot, by statute, be authorized to raise funds for such purposes, and bonds issued by a municipality in aid of a manufacturing enterprise are void, because the promotion of private manufacturing enterprises is not a public purpose."

Private Consumer May Attack Unreasonable Water-Rates

The opinion of the New York Supreme Court for Westchester County in the case of Town of Mamaroneck vs. New York Interurban Water Company, 212 New York Supplement, 629, deals with forty different legal aspects bearing upon the right of the town and its inhabitants to prevent defendant from putting into effect increased water-rates. One of the most important declarations made by the Court was:

"The lawful right of any private consumer to insist upon a supply of water at reasonable rates is so clear that it exists, even against the agreement of the municipality in which he resides, made with the company, purporting to establish a minimum rate."

Objections That Were Unavailing Against a Sewer Improvement

Concerning objections made by taxpayers to assessments for a municipal sewer improvement, the Missouri Supreme Court said in the case of Williams vs. Hybskmann, 278 Southwestern Reporter, 377:

"The establishment of the private sewers, before the city saw fit to proceed under the statute, only showed the necessity for sewers, and the fact that sewers were thus established by individual action should not hamper the city in its power to establish sewers for all persons in that portion of the city.

"As for certain parts of the district not having water facilities, the fact that there was no sewerage may be the reason for such lack, and, if that be a valid reason, then the opportunity for obtaining these advantages would be forever forbidden by these objections moving in endless chain. It does not appear that the property in the territory already possessed of sewer advantages could have been made into a separate district of its own and the other districts created outside of it. The construction of the private sewers could not interfere with or hamper the city in the exercise of its power."

The U. S. Bureau of Public Roads

(Department of Agriculture)

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The Official Report of these Tests appears on Pages 36 to 45, inclusive, of the April, 1926, issue (Vol. 7, No. 2) of "Public Roads," the Official Monthly Research Publication of the United States Bureau of Public Roads.

If you do not subscribe to that important publication, we will gladly furnish you with the April number upon receipt of a request, written on your letterhead.

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American Vibrolithic Corporation

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SALES OFFICES IN 23 OTHER CITIES

Zoning Notes

Prepared by Frank B. Williams
Author of "The Law of City Planning and Zoning"
From data collected by the Zoning Committee of New York (233 Broadway)
Mr. Williams may be addressed in care of THE AMERICAN CITY, 443 Fourth Avenue, New York

Recent Zoning Statutes and Ordinances

DISTRICT OF COLUMBIA.—Act of Congress approved April 16, 1926, amending the act regulating the height of buildings approved June 1, 1910. The act of 1910 fixed a maximum height limit for the city of Washington at 110 feet. The amendment permits the erection of a building (the Press Club) at the corner of 14th and F Streets to a height not to exceed 140 feet.

The passage of statutes granting exceptions to general building regulations in special cases is most unfortunate, especially in a city with a zoning ordinance. Such exceptions should be made only in a method prescribed by general rule, giving all persons claiming hardship an opportunity to prove it before a competent tribunal, as, for instance, a board of appeals, whose discretionary finding is subject to court review.

LONG BEACH, CALIF.—Ordinance, April 7, 1925.

GREENWICH, CONN.—Ordinance, February 1, 1926

HARTFORD, CONN.—Ordinance, February 9, 1926

FLORIDA.—City of Eustis, Spec. Acts, 1923, ch. 9747; Town of Seabreeze, Spec. Acts, 1923, ch. 9001.

ST. LOUIS, MO.—Ordinance, approved by Mayor, April 26, 1926

NEW YORK.—Planning enabling act for cities, with zoning provisions, 1926, ch. 690.

NEW YORK.—Planning enabling act for villages, with zoning provisions, 1926, ch. 719.

NEW YORK.—General zoning enabling act for towns, 1926, ch. 714.

NEW YORK.—Zoning enabling act for certain towns 1926, ch. 715.

GLEN COVE, N. Y.—Ordinance, May 3, 1926

LYNBROOK, N. Y.—Ordinance, January 4, 1926

MILL NECK VILLAGE, N. Y.—Ordinance, April 17, 1926

VIRGINIA.—Enabling act, March 26, 1926

Pioneer Legislation in New York

Two laws* just passed by the Legislature of the state of New York, give municipalities in that state powers which they have never been able heretofore to exercise. Although in the main dealing with the planning of the public features of the community, their effectiveness is in no small measure due to the correlation they effect between the laying out of these features and zoning which regulates the private features within the community.

For an outline of the scope of this new legislation, and the text of the city law, see pages 671 to 674 of this issue. The village law is identical in purpose with the city law and practically identical in wording.

*** Laws of 1926, Chapters 690 and 719. Based on the pamphlet, "Planning of Unbuilt Areas in the New York Region—A Form of State Enabling Act with Annotations," published by the Regional Plan of New York and Its Environs, 130 East 22d Street, New York; prepared by Edward M. Bassett, Director Legal Division.**

Recent Zoning Decisions

MARYLAND.—*Tighe v. Osborne, Inspector of Buildings for Baltimore City, Court of Appeals,* reported in the *Baltimore Daily Record,* April 10, 1926. An ordinance empowers the Zoning Commissioner to refuse to issue permits for proposed "structures, use or changes of use of which would create hazards from fire or disease or would menace the public security, health or morals." *Held* that the delegation of power by the City Council is valid. The language used correctly designates objects to which it is universally conceded the police power applies; and the city under its charter has the right to exercise within the limits of the municipality the full police power of the state.

And the delegation of power by the Council to the Zoning Commissioner is a proper one. It has its limits, laid down in the ordinance and by decisions of the Court. Sufficient rules are therefore stated to guide the Commissioner in the exercise of his discretion.

NOTE BY EDITOR.—While this ordinance may serve a useful purpose, it should be borne in mind that it is not, properly speaking, a zoning ordinance. Zoning should be comprehensive, and in accordance with rules and plans known in advance; this ordinance gives an official the power to decide each case, as it arises, upon its merits.

NEW YORK.—*Matter of Brady (Walsh et al.), Supreme Court,* reported in *New York Law Journal,* April 26, 1925. A well-reasoned case in which it is held under the circumstances, carefully considered by the Court, that (1) the decision of the Court of Appeals does not constitute an annulment of provisions of the zoning ordinance but (2) is a variation to relieve practical difficulties and unnecessary hardships, and (3) is a reasonable exercise of discretion which the Court will not disturb.

NEW YORK.—*Matter of Fox Lane Corporation v. Mann; same v. Moore; Supreme Court, Appellate Division,* reported in *New York Law Journal,*

The Tourist Prepares

WITH the first days of May the motorist begins to tune up his engine and count the days and weeks until vacation—and the call of the road. For the next few weeks, until the glorious day when he starts out with bag and baggage, he will be studying road maps and blue books, planning his tour in advance.

Be sure of one thing: So far as possible his trip will follow those roads which the maps show as "Paved" or "Improved." He has been touring before. He knows the discomfort of bumping over rough roads that nullify the best of shock absorbers. He knows what it means to plow through sticky mud or through dust that chokes and blinds him. He wants no more of them. He is looking for pleasure, not adventure. He stays on the good roads, where he finds comfort and safety.

Many communities are losing the profitable patronage of the motor tourists because of a mistaken impression that the expense of improving their roads would be very high. Every community may have good roads at small expense by using

Stanolind Paving Asphalt and Standard Asphalt Road Oils

Our engineers will be glad to make a survey of your roads, without charge, recommend the correct grades of asphalt or road oils for your requirements, and make an estimate of the expense.

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ILLINOIS	INDIANA	IOWA	MICHIGAN	WISCONSIN	MISSOURI
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Decatur	Indianapolis	Des Moines	Grand Rapids	Milwaukee	St. Joseph
Joliet	South Bend	Mason City	Saginaw	MINNESOTA	St. Louis
Peoria	KANSAS	Sioux City	N. DAKOTA	Duluth	
Quincy	Wichita	S. DAKOTA	Fargo	Mankato	
		Huron	Minot	Minneapolis	

April 17, 1926. Mandamus orders reversed upon the law, and application for mandamus order denied. Since the repeal, on October 3, 1924, of former Section 24 of the New York City Building Zone Resolution, there is nothing in the Resolution to save existing permits, and as there was no work commenced, or building erected or in course of construction at the time of the amendment, the provisions of the present Section 24 of the Resolution which prevent the operation of an amendment to existing buildings or premises do not apply, and the expenditure made and obligations incurred by the respondent in reliance upon the permit in question were insufficient to give a vested right to erect the building in question in violation of the amendment. (People ex rel. Publicity Leasing Co. v. Ludwig, 218 N. Y. 540).

NEW YORK.—The newspapers report a decision of the Supreme Court with relation to a zoning ordinance of the city of Troy, as follows: The defendants seek to erect a gasoline tank in a business district. The ordinance provides that such a building shall not be so erected except on consent of the owners of 70 per cent of the frontages within 200 feet. No such consents were filed. Held that an injunction could not be granted because:

The state law did not authorize the city of Troy to issue permits on consent of property owners.

A provision allowing such issuance would be an unconstitutional delegation by the City Council of legislative power to property owners.

An injunction will not issue because (1) the station in that locality is not a nuisance; (2) the plaintiff has not exhausted his remedies, by appeal to the Court of Appeals, on account of undue hardship; (3) there can be no appeal by a citizen unless he is specially injured.

Recent Zoning Literature

Newman F. Baker, Graduate Fellow of the University of Chicago Law School, has issued in book form a collection of his magazine articles on the legal aspects of planning and zoning, as follows:

I. Municipal Aesthetics and the Law. Reprinted from (February, 1926) Ill. L. Rev., 20:546.

II. The Constitutionality of Zoning Laws. Reprinted from (November, 1925) Ill. L. Rev., 20:213.

III. Zoning Legislation. Reprinted from (February, 1926) Cornell L. Quart., 11:164.

IV. Zoning Ordinances. Reprinted from (February, 1926) Iowa L. Rev., 11:152.

V. The Zoning Board of Appeals. Reprinted from (March, 1926) Minn. L. Rev., 10:277.

The Municipal Bond Market

By Sanders Shanks, Jr.

Editor of *The Bond Buyer*

THE largest volume of municipal financing is usually effected during the spring of the year, increasing each month until June, when the peak is generally reached. The total for the month of May will exceed by many millions of dollars that of any other month so far this year, except February, when a single issue of New York City bonds added $75,000,000 to that month's total.

The city of Baltimore sold $18,822,000 4 per cent bonds at a net interest cost to the city of 4.11 per cent, which is the best price that the city has obtained for its bonds since August, 1924. This block of bonds was the largest single piece of financing that the city has ever effected. Boston, Mass., disposed of $4,395,000 4's at a price to yield 3.98 per cent. There were many other offerings of interest to bond dealers, as shown in the list below.

Other offerings of importance which are scheduled to be sold later in the month than the time of this writing are $22,088,000 Detroit, Mich., $10,082,000 Westchester County, N. Y., $4,236,000 Jersey City, N. J., $5,000,000 Chicago Sanitary District, Ill. These issues are all awaited with interest by the dealers, and indications are that their sale will be attended by sharp competition.

A list of important municipal offerings of the month is given below:

Amount	Issue	Maturity	Rate %	Yield %
$4,395,000	Boston, Mass.	1927-56	4	3.98
491,000	Essex Co., N. J.	1927-76	4¼	4.12
2,000,000	Minneapolis, Minn.	1927-51	4 & 5	4.13
482,000	Cohoes, N. Y.	1927-41	4½	4.16
979,000	Wyandotte, Kans.	1927-46	4½	4.24
450,000	Kenosha, Wis.	1933-46	4½	4.18
900,000	Linn Co., Ia.	1928-40	4¼	4.24
375,000	Oyster Bay, N. Y., U. F. S. D. No. 4.	1927-41	4½	4.26
1,100,000	Milwaukee Co., Wis.	1937-46	4½	4.26
1,540,000	Hawaii	1956-46	4½	4.27
700,000	San Diego, Calif.	1930-65	5	4.38
1,100,000	Fort Collins, Colo.	1940	4½	4.40
590,000	Akron, Ohio.	1927-46	4¾	4.43
810,000	Ferndale, Mich.	1927-56	4¼ & 4½	4.47
860,000	Port of Portland, Ore.	1927-41	4½	4.48
330,000	Lake Charles, La.	1927-66	4¾	4.65
2,562,000	Macomb Co., Mich.	1928-36	4¾	4.69
602,000	Long Branch, N. J.	1928-66	4¾	4.74
375,000	Newport News, Va.	1928-46	4½	4.98
2,100,000	St. Petersburg, Fla.	1955-6	5	5.00
1,400,000	Dade Co., Fla. Sp. Tax Sch. Dist. No. 2	1929-54	6	5.81
1,100,000	W. Palm Beach, Fla.	1927-36	5	5.85
900,000	Winter Haven, Fla.	1927-36	6	7.10

A NEW DEPARTMENT OF MUNICIPAL FINANCE AND ACCOUNTING

Beginning with the July issue, a section devoted to Municipal Finance and Accounting will be a regular monthly feature of this magazine. This department will be conducted by Francis Oakey, C.P.A., of the firm of Searle, Oakey & Miller of New York.

Among the many subjects to be discussed will be:

Safeguarding the City Treasury
The Functions of the City Comptroller
The Operation of the Tax Collector's Office
Accounting for the City's Funds
The Need for Information Respecting Municipal Finances
The Factors Which Determine the Financial Auditing of a City
The Budget as an Instrument of Control

WORTHINGTON

Diesel Engine Driven Pumps

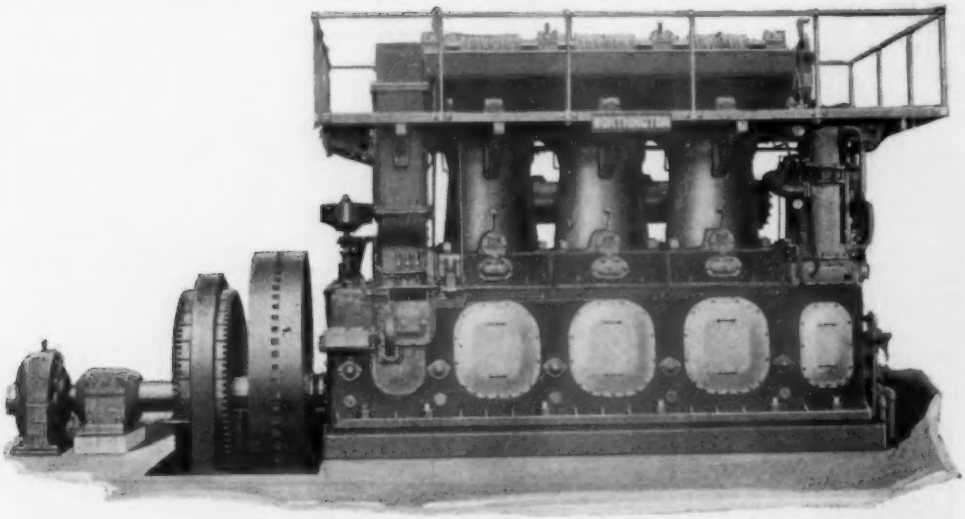
There is an increasing demand for Diesel engine driven pumps.

While at the Buffalo Convention of the American Water Works Convention, you are invited to visit the Snow-Holly Plant where Worthington Air-injection Type Diesel Engines, as shown below, are built.

Buses starting from the Hotel Statler will run to the Snow-Holly Plant Wednesday, Thursday and Friday afternoons of convention week.

For particulars inquire at the Worthington booth in the exhibit room, Hotel Statler.

Worthington Four-cycle, Air-injection, Diesel Oil Engine.



WORTHINGTON PUMP AND MACHINERY CORPORATION

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BRANCH OFFICES IN 24 CITIES

A Small City's Achievement in Fire Protection

Albany, Ga., Again Wins First Prize in the Inter-Chamber Fire Waste Contest

ALBANY, GA., has won not only first prize among the cities of its class, but the grand prize among cities of all classes entering the fire waste contest for 1925 conducted by the Chamber of Commerce of the United States. Albany won first prize for 1924 in its own class, repeats its triumph for 1925, and for its intelligent and effective fire prevention activities now leads the entire country. A low fire loss and a small number of fires in proportion to population for a single year may well be an accident. But when a city shows a consistent record of a small number of fires and a low fire loss over a period of years, there is more than negative evidence that something besides good fortune must be given credit for results.

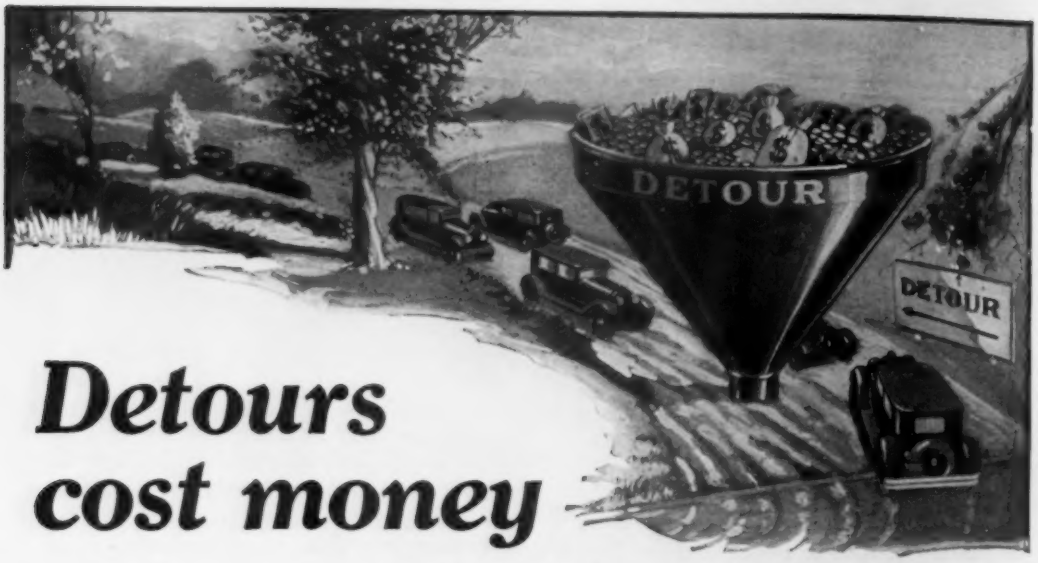
Albany has a population of 18,000. Its fire waste in 1924 was $7,838, or $0.43 per capita. Its average per capita loss for the five-year period 1920-1924 was $1.73. For 1925 it was $1.50. There has been no life loss from fire in Albany for 15 years. Notwithstanding the rapid growth of this little city and the greater property risk involved, the fire-alarms have been reduced from 135 in 1916 to 127 in 1925, while nearly every other city in the country shows marked fire-alarm increases for this period. Albany is favored with the lowest fire insurance rate of any city in Georgia, perhaps in the South.

Unusually Competent Administration of Fire Department

What is the explanation of the forces and conditions present in this little southern city that enable her to surpass all other cities large and small in fire safety? Albany has a Fire Chief of such character and intelligence as actually to be able to register his efforts. His personal influence extends into the humblest home in Albany. All of the fire prevention educational activities found useful in other cities have for several years been carried on by him, but something else has been going on. The Fire Chief has brought local improvements definitely to pass. He has taken his logical position as the conservator of Albany's fire safety, and his public educational routine has been established with the object of building up a community interest and morale that would permit him to do definite things. This public intelligence began to register some years back. The Chief began to investigate the cause of every fire, and publish it. Most fire causes constitute personal criticisms if made public. People do not like to be held up for inspection. Three years ago a reasonable building code was enacted. This is being enforced. The code outlawed the wooden shingle. Forty-five of the 127 fires last year were from this cause—sparks on old wooden shingle roofs not yet replaced. Albany will soon be reasonably free from this pest and menace.

Then there is the unusually competent administration of the Fire Department itself. The uniformed firemen inspect the city continuously. This does not mean strolling down the street and marking something on a pad. The Department sends a uniformed fireman

PLAQUE PRESENTED TO THE ALBANY, GA., CHAMBER OF COMMERCE AT THE MEETING OF THE NATIONAL COUNCIL OF THE CHAMBER OF COMMERCE OF THE UNITED STATES ON MAY 10
Similar trophies of smaller design were awarded to the Chambers of Commerce of Portland, Ore., Long Beach, Calif., and Battle Creek, Mich., at the same time



Detours cost money

COUNT up the times this year that you are thrown off your route by detours and note *how few* times it is caused by repair work on *vitrified brick pavements*.

There are brick pavements in use today laid more than a quarter-century ago which have not yet had a dollar of repair cost charged against them. Even though designed only for the easy burdens of light buggies, farm wagons and horse-drawn drays, scores of these veteran brick pavements have proved able to carry the modern 10-ton motor truck.

The paving material that holds upkeep and repair cost to a minimum and saves its community from detours is *vitrified brick*, the most economical pavement a community can buy.

Pave With **VITRIFIED Brick**

The Pavement that Outlasts the Bonds

NATIONAL PAVING BRICK MANUFACTURERS ASSOCIATION, ENGINEERS BLDG., CLEVELAND, OHIO

through every cotton warehouse in the city at 10 P. M., 1 A. M., and 4 A. M. every night. During the drouth last year the ginning plants were continuously supervised and the firemen located and removed seven individual bales of cotton, at different times, that were on fire, the loss in each case being confined to a small portion of the bale. Through the night, regular rounds of the business district are made, with inspections of each store and building. Several small fires were thus discovered last year and extinguished with slight loss in premises where the potential loss was great. The Department carries salvage covers on the apparatus, and its efficiency has so increased as the men have progressed in this necessary work, during and after fires, that many hundred dollars of property damage was avoided last year. The officers and members are thoroughly trained and kept physically fit by regular daily exercise and weekly company drill with the equipment.

Wisdom of Additional Water Storage Reservoir

As a result of the general fire prevention consciousness of Albany, the provision of an additional reservoir for water storage was secured with little opposition and its wisdom demonstrated at the only serious fire of 1925. One hundred and twenty-six of the 1925 fires were controlled with a loss of $6,106. The one hundred and twenty-seventh was the Southeastern Compress fire, occurring in the drouth period. The building was 200 feet by 1,200 feet, entirely frame, but with two fire-walls. This fire had gained great headway before the Department arrived, but was confined to one of the compartments, with a loss of $21,000 and salvage of $483,000. The Department used 16 hose streams on this fire with a hydrant pressure of 125 pounds and despite the dry period did not deplete the water storage supply. Had it not been for this fire, the per capita loss of Albany for 1925 would have been but 33 cents, comparing favorably with Continental Europe.

When we contemplate the conditions that exist in Albany, the consciousness of her people and the competence and intelligence of her Fire Department, while knowing the conditions that exist in the average American city, we are led to wonder how many years in succession she will walk off with the prize given for fire prevention superiority. In January of this year, before the second and grand prize had been won, a larger city made a bid for Albany's Fire Chief. He declined the offer. He enjoyed working in a city whose citizens gave him cooperation and shared his pride in advancing fire safety. Not being backward in showing appreciation of his fine attitude, the city increased the Chief's compensation 50 per cent. We shall be surprised if Albany, Ga., is soon overtaken in her race with the still comparatively small number of cities that are manifesting interest in their fire safety.

—From the April, 1926, issue of the Quarterly of the National Fire Protection Association.

Effect of Signal Lights on Traffic and Accidents

(From a Bulletin Issued May 10, 1926, by the National Automobile Chamber of Commerce)

Signal lights are increasing the vehicle capacity of streets and reducing the number of motor accidents in the opinion of most of the thirty-six cities reporting to the National Automobile Chamber of Commerce in an investigation on this subject.

Twenty-nine of these cities affirm that the use of signal lights reduces the number of accidents, two believe that it does not, and the remainder make no comment.

Twenty-six report that the adoption of lights has made it possible to increase the volume of traffic on streets. Five are of the opinion that signal lighting is not helpful in this regard, even though useful as a safety measure. That improved regulation is having beneficent effects seems to be borne out by the figures of motor fatalities for the first quarter which register a 4% decrease for the same period a year ago. January started off as a high month in comparison with 1925 due in part perhaps to differences in weather conditions. February and March conversely register considerable reduction enough to more than offset the January increase.

City	Have Lights Increased Flow of Traffic?	Reduced Accidents?	Did City Keep Accident Records Before Lights Installed?	Did City Keep Traffic Flow Records Before Lights Installed?	Are Traffic And Accident Records Kept Now?
Baltimore, Md.	Yes	Yes	Yes	Yes	Yes
Bayonne, N. J.	No	Yes	No	No	
Berkeley, Calif.	Yes		Yes	Yes	Yes
Bridgeport, Conn.					
Cleveland, Ohio	Yes	No	Yes	No	Yes
Columbus, Ohio	Yes	Yes	Yes	Yes	Yes
Dallas, Texas	Yes	Yes	No	No	Yes
Davenport, Iowa	Yes	Yes	No	No	Yes
Dayton, Ohio	Yes	Yes	No	No	No
Des Moines, Iowa			Yes	Yes	Yes
Flint, Mich.	Yes	Yes	Yes	No	Yes
Fort Wayne, Ind.	No	Yes	Yes	Yes	Yes
Fort Worth, Texas	Yes	Yes	No	No	Yes
Gary, Ind.	Yes	Yes	Yes	No	No
Hartford, Conn.	Yes	No	No	Yes	Yes
Houston, Texas	Yes	Yes	Yes	Yes	Yes
Huntington, W. Va.	Yes	Yes	Yes	Yes	Yes
Indianapolis, Ind.	No	Yes	No	Yes	No
Knoxville, Tenn.	Yes		No	No	Yes
Lansing, Mich.	No	Yes	No	No	No
Lincoln, Nebr.	Yes	Yes	No	No	Yes
Los Angeles, Calif.	Yes	Yes	No	No	Yes
Minneapolis, Minn.	Yes	Yes	Yes	Yes	Yes
Oakland, Calif.	Yes	Yes			
Oklahoma City, Okla.	Yes	Yes	No	No	No
Racine, Wis.	Yes	Yes	No	No	No
Roanoke, Va.			Yes	Yes	Yes
Rockford, Ill.	No	Yes	Yes	No	No
Salt Lake City, Utah	Yes	Yes	No	No	No
Seattle, Wash.	Yes	Yes	No	No	
South Bend, Ind.	Yes	Yes	No	No	Accident Only Yes
Springfield, Mass.					
Syracuse, N. Y.	Yes	Yes	Yes	No	Accident Only
Tampa, Fla.	Yes	Yes	No	No	No
Toledo, Ohio	No	Yes	No	No	No
Wichita, Kans.	No	Yes	Yes	Yes	Yes
Washington, D. C.	Yes	Yes	Yes	Yes	Yes

Virginia Ave.,
Atlantic City,
N. J.

It's the foundation that counts

For street track foundation, the most generally acceptable material is concrete.

If you use concrete, use:

International
STEEL TWIN TIES

The Steel in these ties, with nearly the same coefficient of expansion as concrete, is so designed as to protect and reinforce the concrete. With Steel Twin Ties, there is no likelihood of the development of gaps or voids in the concrete where water may collect and start progressive track troubles.

TWIN TIES cut labor and material costs.
TWIN TIES prolong the life of joints.
TWIN TIES are also being widely used in tracks on concrete bridge floors.

Write for our illustrated catalog, describing "New Construction Methods for Renewable Paved Track."

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The Regional Scheme of the Manchester and District Joint Town Planning Advisory Committee.—Report by the Committee. In two parts: 170 pp.; and maps. Apply to the Hon. Secretary of the Committee, Town Hall, Manchester England. $4.00 postpaid.

An elaborate, comprehensive, and most attractive presentation of the plans of the Committee for the progressive development of the Region, in order to make the most of its industrial resources and to produce the best possible living conditions. The main industry is the manufacture of textiles. The increase of population in this section makes it necessary that the most productive use be made of every bit of land and that the facilities of communication be fully developed. All future progress of the Region will be along predetermined lines; thus waste and confusion will be prevented. The Region consists of parts of the counties of Cheshire, Derbyshire, Lancashire, and Yorkshire, covering about 1,020 square miles, and there are 104 local authorities administering within it. A wealth of maps and views make clear every phase of the study, which is developed under the heads of General Survey of the Region; Communications; Zoning; Places of Historic Interest; Mining Areas; Public Utility Services; Town Planning; with interesting material in introduction and summary.

Public Works, Roads and Transport Congress and Exhibition, 1925.—Final Report, published by the Congress Organising Committee, 84, Eccleston Square, S. W. 1, London, England. 516 pp. Maps, photographs, charts, diagrams. The Congress and Exhibition, which is organized by a joint committee representing the principal associations of local authorities and their officers, is held in London in November every other year. The Organizing Committee endeavors to further the best scientific training for students, the immediate objective being the establishment of a chair of Highway Engineering, to provide opportunities for members and officials to discuss problems and methods and to inspect the latest types of materials and machinery for public works, and to show the general public the work that is being done in their behalf. The papers and discussion here presented include sewage disposal and purification, activated sludge experiments, various problems of water-supply, land settlement, road and bridge construction, lighting, regional planning, and housing. (Apply to the publishers.)

The Freedom of the City.—By Charles Downing Lay, Fellow, American Society of Landscape Architects, Duffield and Company, New York. 1926. 115 pp. $1.00.

Enthusiasm and admiration for the city, appreciation of its advantages and facilities, championship of its very lacks and failings as characteristics that we really like after all—these are buoyantly expressed throughout this enlivening little volume. Congestion is, it seems, "what we came for, what we stay for, what we hunger for," which means that there is an endless list "of things that we are able to enjoy at will because there are so many of us." Coming close upon a study elsewhere of the shameful housing conditions in New York City, it is somewhat startling to find here the statement: "The congestion of many people living in one room cannot, I suppose, ever be prevented. It is as bad in the country as in the city, and in either case is most likely due to some mental infirmity of the family." The garden city comes in for its share of condemnation as an idealistic scheme "open to the gravest objections, social and economic." The light touch, the gay casting aside of other points of view and other experience, make this a fascinating brief, even to the extent of enabling one to read without irritation: "I suspect that those who show great annoyance in the subway are visitors from the solitudes, little accustomed to people and only at home in the out-of-doors."

The City and County of Lebanon, Pa.—A survey compiled by the Chamber of Commerce, Lebanon, Pa., of industry, commerce, finance, and agriculture in the county, and therefore of interest to industrialists, citizens of Lebanon, and farmers. 28 pp. (Apply to the Chamber.)

A Handbook for City Officials of the Fifth and Sixth Class Cities of the State of California.—By Wm. J. Locke, Executive Secretary, League of California Municipalities. Third edition. 1926. Published by A. Carlisle & Co., San Francisco. 316 pp. (Apply to publishers.)

The League of California Municipalities has issued this book for the benefit of the officials of its member municipalities. Each member of the League is entitled to one copy free of charge. Other copies may be obtained at nominal cost from the publishers. The book comprises a collection of those sections of the state constitution and the general laws which concern municipalities, also that portion of the municipal corporation act which constitutes the basic law under which California fifth and sixth class cities are governed. It also contains valuable information for the officials of newly incorporated towns, including a number of model forms and ordinances. This third edition of the handbook presents a model city charter, with comments, and instructions as to how to obtain a charter.

Civics of My Community.—By J. Wesley Foote, Principal John Barry Public School, Philadelphia; Lecturer in the Teaching of History and Civics, University of Pennsylvania. World Book Company, Yonkers-on-Hudson, N. Y. 1926. In four books—104, 72, 88, and 120 quarto pp., respectively, besides introductory pp. Paper covers, 68 cents each.

This is a laboratory textbook planned to help pupils to investigate their community, to analyze the local civic material, to comprehend its application in their own lives, to understand their privileges, duties, and responsibilities as citizens. It is intended to be used with frequent reference to works on civics, to reports, maps, and other sources of governmental information. The student makes his own textbook and notebook. The four parts comprise a complete course in community civics, starting with the comprehension of the community idea, and proceeding through studies of public health, protection of life and property, education, recreation, city planning, transportation, communication, the use of public and private wealth, to the structure and administration of local government. The author has truly made "the dry bones to live."

Highway Research Board.—Part II of the Proceedings of the Fifth Annual Meeting of the Highway Research Board, held at Washington, D. C., December 3-4, 1925. Printed in advance of Part I. Covering the report of the special investigation of the Economic Value of Reinforcement in Concrete Roads, by C. A. Hogentogler, of the Highway Research Board. Edited by Charles M. Upham, Director of the Board, and S. S. Steinberg, Assistant Director. Published by the Division of Engineering and Industrial Research of the National Research Council, B and 21st Streets, Washington, D. C. 135 pp. Photographs, diagrams, tables. Reports on a number of supplementary studies are also given. In this investigation roads in all parts of the country were examined, so that the report covers a vast majority of local conditions. (Apply to the publishers.)

American Road Builders' Association.—Proceedings of the Twenty-third Annual Convention, held in Chicago, Ill., January 12-14, 1926, including a list of exhibitors at the Seventeenth Annual Road Show. Published by the Association, 37 West 39th Street, New York. 281 pp. Illustrated. $3.00. The papers and discussions cover the following subjects: the financing and planning of roads; making contracting pay; traffic problems on highways and city streets; paving practice and the handling of materials and equipment; road maintenance; and the relations between contractor and engineer. (Apply to the publishers.)

Gas Systems for Welding and Cutting.—Regulations of the National Board of Fire Underwriters for the installation and operation of such systems, as recommended by the National Fire Protection Association. Edition of 1925. Pocket size. 21 pp. (Apply to the National Fire Protection Association, 40 Central Street, Boston, Mass.)

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Automobile Green Book.—Published by Scarborough Motor Guide Company, Indianapolis, Ind., and Boston, Mass. Volumes 1 and 2 for 1926. 891 and 987 pp. respectively. Each $3.00.

A valuable road reference and tourists' guide, with folding map in each volume, and many local maps in the text. Volume 1 covers the New England States, Canada, and the trunk lines west and south, and is the official guide book of the Automobile Legal Association. Volume 2 covers New York, Pennsylvania, Canada, New Jersey, Maryland, Delaware, District of Columbia, Florida, and trunk lines east and west and is the official guide book of the New York State Automobile Association. Each volume is also a golf club guide.

The Work of the 1926 Legislature of New Jersey. The Legislative Reference Department of the New Jersey State Library, following the practice of former years, has issued a Descriptive List of the Laws and Joint Resolutions enacted by the 1926 Legislature. This gives the bill and chapter number of every measure enacted ,together with the name of the introducer and a statement of just what the law does. Compiled by John P. Dullard, State Librarian, Trenton, N. J. 30 pp. (Apply to the State Library.)

The Selection, Care, and Operation of Fire-Fighting Equipment.—By Harry J. Corcoran, Chief Engineer, Iowa Insurance Service Bureau, Des Moines, Iowa. A paper presented at the first Short Course for Fire Fighters, held at Iowa State College, October 13-16, 1925. Bulletin 79 of the Engineering Extension Department. October 28, 1925. 16 pp. A general discussion of the larger pieces of apparatus generally used—types, not specific makes. (Apply to the Engineering Extension Department, Iowa State College, Ames, Iowa.)

Housing and Regional Planning, New York State.—Report of the Commission of Housing and Regional Planning to Governor Alfred E. Smith and to the Legislature of the State of New York, on Cost of Government, Land Value and Population; with an Analysis of the Cost of Municipal and State Government, and the Relation of Population to Cost of Government, Income and Land Values in New York State, by Donald H. Davenport. January 11, 1926. 107 pp. Charts, tables. (Apply to Clarence S. Stein, Chairman of the Commission, 949 Broadway, New York.)

Industrial Survey of Peoria, 1926.—Report of a survey conducted by the Peoria Association of Commerce in order to present to those living outside of the city an accurate picture of the advantages and resources of Peoria, and to analyze for the citizens the possibilities of local commercial, social, and educational advancement. 17 pp. Maps, tables. (Apply to the Association.)

Modern Trends in Public Health.—By James A. Tobey. A paper read before the Minnesota State Conference of Social Work, in September, 1925. Reprinted from Hospital Social Service. 13 pp. A comprehensive summary of what has been done, through the ages, to lengthen the span of life and to improve its quality, with an inspiring look into the future of the science of public health. (Apply to the author, at the Institute for Government Research, 26 Jackson Place, Washington, D. C.)

Program of Progress Questionnaire.—Issued by the Perth Amboy Chamber of Commerce and designed to enlist support for progressive undertakings by the Chamber to cover the next three years, and to secure intelligent comment from the members of the Chamber upon the relative importance of various lines of action for civic, industrial, and commercial development. A 4-page folder. (Apply to Perth Amboy Chamber of Commerce, Perth Amboy, N. J.)

Combating the Third Great Plague.—The Control of Venereal Diseases in Detroit. By R. S. Dixon, M. D., Director of Venereal Clinic, Department of Health, Detroit, Mich. 16 pp. The October-November-December, 1925, issue of *City Health*, the bulletin of the Detroit Department of Health. "Education and tolerance the keynotes." (Apply to the Department.)

Standards for Physicians Conducting Conferences in Child-Health Centers.—At a conference of state directors of maternity and infant hygiene, the Children's Bureau was requested to appoint a committee to formulate such standards. The standards were drafted by the Pediatric Advisory Committee of the Children's Bureau, and have been approved by various authorities on pediatrics. 11 pp., besides inserted record forms. This is Bureau Publication No. 154. (Apply to Government Printing Office, Washington, D. C.)

Better Operation for Iowa Sewage-Treatment Plants.—By Hans V. Pedersen, Civil and Sanitary Engineer, Iowa State Department of Health, Des Moines, Iowa. One of the general papers presented at the Seventh Conference on Sewage Treatment, at Ames, Iowa, November 12-14, 1925. Published February 10, 1926. 8 pp. Summarizing the unsatisfactory conditions as to operation of many municipal sewage-treatment plants in Iowa, and recommending remedies. (Apply to Engineering Extension Department, Iowa State College, Ames, Iowa.)

American Association for Promoting Hygiene and Public Baths.—The April, 1926, issue of the Journal of the Association gives the report of the annual Memorial Meeting to honor the memory of the founder of the Association, Dr. Simon Baruch, held October 29, 1925, at the Dr. Simon Baruch Public Bath, 326 Rivington Street, New York; and of the Annual Meeting held in Richmond, Va., May 8 and 9, 1925. It contains a number of interesting papers on various features of the work, for better recreation and for health and sanitation; also a summary of the state regulation of public baths, swimming pools, laundries or washhouses, and comfort stations, with the particular regulations, in full, of certain states; with the standards of the Association for swimming pools and shower-baths, and an analysis of swimming pool regulations, by Arthur Morton Crane. 94 pp. Illustrated. $1.00. (Apply to Arthur Morton Crane, Editor of the Journal, Roselle Park, N. J.)

Street Lighting Schedules, 1926.—Bulletin No. 75 of the Engineering Extension Department of Iowa State College. December 2, 1925. A 6-page folder, giving the all-night and moonlight schedules in Iowa for each day of the year 1926. (Apply to the Engineering Extension Department, Iowa State College, Ames, Iowa.)

Patriotic Songs.—A song sheet issued by the Playground and Recreation Association of America, 315 Fourth Avenue, New York, to meet the demand for an inexpensive collection for use at anniversary celebrations. It is expected that Independence Day and other national holidays will be observed with unusual interest this year on account of the country's Sesqui-Centennial. The sheet contains the words of ten songs which are sure to be acceptable on such occasions. 70 cents per 100. (Apply to the Association.)

International Association of Fire Engineers.—Proceedings of the Fifty-third Annual Convention of the Association, held at Louisville, Ky., September 29-October 2, 1925. Published by the Secretary, James J. Mulcahey, Chief, Fire Department, Yonkers, N. Y. Reported by Master Reporting Company, New York. 260 pp. Illustrated. Interesting verbatim material on the various phases of the work of the Association. (Apply to the Secretary.)

A Bibliography on Probation, Juvenile and Domestic Relations Courts, Crime, Psychiatric Treatment and Related Subjects.—Published by the National Probation Association, Inc., 370 Seventh Avenue, New York. 15 pp. (Apply to the publishers.)

Public Ownership.—Published by the New York Federation of Progressive Women, Room 406, 15 East 40th Street, New York. A primer on the subject, with questions and answers regarding facts, policies, and arguments in this field. The trend of the answers is in favor of public ownership. Pocket size. 12 pp. 5 cents; 2 cents apiece in lots of 100 and upward. (Apply to publishers.)

Report of a Mental Health Survey of Staten Island.—The survey was requested by social agencies of Staten Island (the borough of Richmond, New York City). The study was made by the National Committee for Mental Hygiene, January-April, 1924, and was directed and reported by Edith R. Spaulding, M. D. Studies were made in the Richmond County Jail, and in the Children's Court, also of children of pre-school age and of public school children. Conclusions and recommendations are given. (Apply to the National Committee for Mental Hygiene, Inc., 370 Seventh Avenue, New York.)

Facing the Problem of Crime.—A Report of the Committee on Municipal and Metropolitan Affairs of the Boston Chamber of Commerce. March 1, 1926. 14 pp. The reason for the Chamber's activity in this matter is a feeling that crime can be diminished in Massachusetts by proper treatment. The report offers a constructive statement of proposals to correct the crime problem. (Apply to the Boston Chamber of Commerce, Boston, Mass.)

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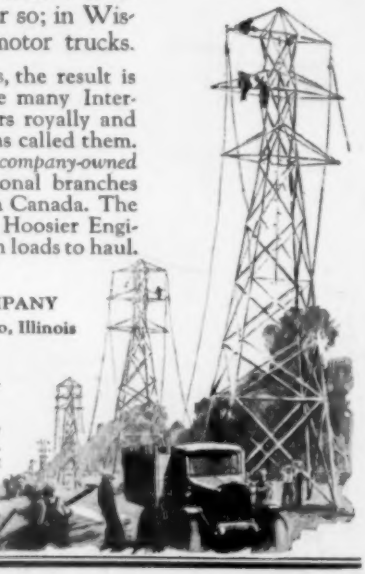

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Qualifications and Duties of a Public Health Nurse.—By J. G. Townsend, Surgeon, United States Public Health Service. 16 pp. in the April 9, 1926, issue of Public Health Reports, published by the United States Public Health Service. Illustrated. A comprehensive and valuable presentation of the work of the public health nurse—"work that embraces more than merely nursing or teaching prevention, for it breaks through the veneer of suspicion and makes the family unit a cooperating agency in economic, moral, and social reforms which make public health possible." 5 cents. (Apply to Government Printing Office, Washington, D. C.)

A Civic Survey of an Iowa Municipality.—By Rolland S. Wallis. A Preliminary Report on a City Plan for Mason City, Iowa. Part 1 and Part 2. Bulletin 76 of the Engineering Extension Department, Iowa State College, Ames, Iowa. February 3, 1926. 126 and 31 pp. Illustrated. The author is Municipal Engineer of the Engineering Extension Department. The survey was undertaken to furnish a basis for a report intended to be of suggestive value to every municipality in Iowa. It is sufficiently comprehensive to cover definitely, though briefly, all the well-recognized elements of city planning, using Mason City conditions and needs as illustrative material. Part 2 includes preliminary instructions to survey committees, a suggested outline for a housing survey, and instructions for a street-tree survey. (Apply to the Department.)

East and West Highways on Long Island.—A bulletin from the Committee on Regional Plan of New York and Its Environs, April 17, 1926. 16 quarto pp. Maps. It sets forth the necessity of special roads for different kinds of traffic and proposes four such roads—two express roads for heavy traffic, and two speedways for light traffic. (Apply to Thomas Adams, General Director of Plans and Surveys, Committee on Regional Plan of New York and Its Environs, 130 East 22nd Street, New York.)

Some Community Responsibilities of Hospitals.—By E. H. Lewinski-Corwin, Ph.D., Director, Hospital Information Bureau of the United Hospital Fund of New York; Consultant in Public Health, United States Public Health Service. A paper read before the meeting of the American Hospital Association at Louisville, Ky., October 28, 1925. 8 pp. in the April 2, 1926, issue of Public Health Reports, published by the United States Public Health Service. Covering the following points: the formulation of an adequate community policy; the discharge of implied moral obligation; the assurance of a high type of performance; broader hospital opportunities for physicians in the community; the delimitation of responsibility for nurse training; live publicity as to hospital service rendered and its cost; the need of morbidity statistics; provision for institutional convalescence, for reclamation of "chronics," and for contagious disease isolation; and participation in health promotion. 5 cents. (Apply to Government Printing Office, Washington, D. C.)

Niagara Frontier Planning Board.—First Annual Report of the Board to the New York State Bureau of Housing and Regional Planning. December 31, 1925. 65 pp. Maps, diagrams. The report covers briefly the preliminary stages of development which led to the organization of the Board and of its publicity and advisory agent, the Niagara Frontier Planning Association, and gives also an account of the Board's progress and accomplishment during the first six months of its operation. George Gove is Director of the Bureau. (Apply to Clarence S. Stein, Chairman of Housing and Regional Planning, 949 Broadway, New York.)

Population Figures for the Cities, Incorporated Villages, Towns and Counties of New York State, According to the Census of June 1, 1925.—The information is given in tables by counties, each county complete in itself. The brief story of the educational campaign that preceded the taking of the census is interesting. Placards explaining the reason for the census and the questions to be asked by the enumerators were printed in many different languages, including Italian, Hebrew, French, Chinese, Greek, and Lithuanian, and were distributed by the thousands in the foreign sections of the larger cities, through cooperation with the police departments. 113 pp. (Apply to Mrs. Florence E. S. Knapp, Secretary of State, Albany, N. Y.)

Street Lighting Designs.—By O. F. Haas, Bulletin 46A of the Engineering Department, National Lamp Works of General Electric Co., Nela Park, Cleveland, Ohio. 18 pp. April 20, 1926. Plan, views, diagrams. Giving lighting "recipes" for business districts, arterial traffic streets, and residence streets, in cities of different populations, with some comments on the maintenance of street-lighting units. The purpose of the study is to help develop an adequate and efficient lighting plan to meet the ever increasing requirements. (Apply to the Department.)

Notes on Leasing of Municipal Real Estate for Housing Purposes.—This typewritten report of 2 pp. gives extracts on this subject from the following: Report of the Housing Committee of the Reconstruction Commission of the State of New York, March 26, 1920; Official Year Book of the Commonwealth of Australia, 1925; Report of the Housing Commission of Milwaukee, November 30, 1918; Housing Report submitted to the City Plan Commission, Newark, N. J., by E. P. Goodrich and George B. Ford. (Apply to Municipal Reference Library, 1005 City Hall, Chicago, Ill.)

Community Centers.—Members' Bulletin of the National Community Center Association, April, 1926. Among other material, this bulletin contains the following: History, Philosophy and Technique of Community Center Organizing in Cincinnati, by Will R. Reeves, Executive Secretary, Cincinnati Community Service; Form of Appeal and Membership Pledge Cards Used in Organizing Cincinnati Community Centers; Form of Organization of Cincinnati Community Centers; Board of Education Control Over Community Centers of Cincinnati. (Apply to Leroy E. Bowman, Secretary and Editor, The National Community Center Association, 503 Kent Hall, Columbia University, New York.)

Progress Through Self-Regulation in Outdoor Advertising.—In the 4-page Bulletin No. 1 (April 12, 1926) issued by authority of the Outdoor Advertising Association of America, 307 South Green Street, Chicago, Ill. At the annual convention of the industry held last fall in Kansas City a five-year program was adopted to make outdoor advertising creditable in substance and decorative in appearance, in order to achieve a result that will be satisfactory to the public, and to the manufacturers who use this medium, and effective for the industry itself. (Apply to the Association.)

A Bibliography on Research.—Selected articles from the technical press, 1923-1925. Published by the Division of Engineering and Industrial Research, National Research Council, 29 West 39th Street, New York. 46 pp. A valuable aid as a reference to research activities in specific industries. (Apply to Maurice Holland, Director of the Division.)

National Association for the Advancement of Colored People.—Sixteenth Annual Report, for 1925. 54 pp. Among the questions dealt with in the Association's work for the year and covered in this report are the following: segregation; legal defense; lynching; disfranchisement; discrimination; and cultural and artistic development of the Negro. The last-named portion of the report presents a most significant change in public attitude. "Today the most important periodicals in the country are open to Negro writers. The greatest publishing houses bring out the books of Negro authors. Negro singers and musicians fill the finest concert halls in the country. Colored singers are soloists with the most famous orchestras." (Apply to the Association, 69 Fifth Avenue, New York.)

Character Problems.—In the April 8, 1926, issue of the Journal of Education, 6 Beacon Street, Boston, Mass., begins a series of articles by A. E. Winship, Editor-in-Chief of the Journal, on character problems. The first editorial is entitled "When the Buzzard Wakes Up" and uses the incident of a buzzard roosting on a hydro-electric cable, waking, and stretching his wings so that they touch live wires and short-circuit the long-distance transmission of electric current, to illustrate the need of seeeing to it that not even one adolescent youth may stretch his wings in such a way as to do the much greater harm that moral short-circuiting causes in the alarming and civic situation of today. Another notable feature that begins in this issue is "Character Chats," by Joseph B. Egan, Headmaster of the Harvard-Frothingham district, Boston, which is being successfully used for moral instruction in the fourth and all higher grades through the ninth. (Apply to the Journal.)

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International City Managers' Association.—The 12th Yearbook, this being the March, 1926, issue of the City Manager Magazine, Lawrence, Kans. It contains the Proceedings of the Twelfth Annual Convention of the Association, held in Grand Rapids, Mich., November 17-19, 1925; also a number of interesting articles and items, the opening one being by Harrison Gray Otis, City Manager of Clarksburg, W. Va., and President of the Association. The Directory of City Manager Cities and Their Managers is given, corrected to March 1, 1926. 242 pp. Illustrated. $1.00. (Apply to the magazine.)

The First P. R. Election in Cincinnati.—19 pp. in the January, 1926, issue of the Proportional Representation Review, published by the Proportional Representation League, 1417 Locust Street, Philadelphia, Pa. The outstanding result of the election, held November 3, 1925, was the overthrow of the Republican organization, which for years had completely dominated the city government but the real support of which was shown by the election to be only about one-third of the total vote. No less than 72 per cent of those who cast valid ballots saw their very first choices elected. (Apply to the Review.)

Athletic Stadia.—Published by the Portland Cement Association, 111 West Washington Street, Chicago, Ill. 10 large pages. Illustrated. Telling how some cities have financed their stadia, and giving detailed descriptions of campaigns, and information about the management of stadia, and about gate receipts. The advantages of using concrete for stadia construction are emphasized. (Apply to the publishers.)

Recreation Training School of Chicago.—Announcements for 1926-1927 with enclosure of 7-page circular on the summer term, July 5-August 6. The School is indorsed by the Chicago Federation of Settlements, and gives training for both men and women. The aim of the training is to develop group leaders who shall understand the individual in his group relationships and to equip them with skill in such activities as offer opportunity for developmental expression. These announcements explain the opportunities of the School, its courses, requirements, and expenses. (Apply to the School, 800 South Halsted Street (Hull House), Chicago, Ill.)

Municipal Ownership of Electric Light Plants.—Chamber of Commerce Resents Statements in Anti-Municipal Ownership Organ. A letter from E. P. Owen, Jr., Manager of the Jacksonville [Fla.] Chamber of Commerce, to George Richard Hilty, Editor of the Southern Utilities Magazine, Palatka, Fla. In the February-March, 1926, issue of the official organ of the Jacksonville Chamber of Commerce. It is stated that Mr. Hilty had published in the November-December, 1925, issue of his magazine a discussion under the heading of Living Expenses which said: "It is interesting to know that the 13 relatively large cities, where living expenses run below the average, have no municipal ownership of electric, gas, street railway or telephone utilities." Manager Owen takes exception to Editor Hilty's article as misleading because based "on the National Industrial Conference Board's misuse of figures," and maintains that municipal ownership and operation of the Jacksonville electric light plant has resulted in a considerable yearly saving to the city's taxpayers. (Apply to the Chamber.)

A Hand Book of Information for Tree Wardens and City Foresters.—Published by the Massachusetts Tree Wardens' and Foresters' Association, which was organized March 27, 1913. Published December, 1925. Compiled and edited by Oliver Goodell Pratt and Everett P. Mudge, Handy size. 47 pp. Containing laws relating to and of interest to a tree warden or city forester, legal decisions relative to shade trees, tables relative to insect pests and tree diseases, and their remedies, a list of publications of value to a tree warden, and information regarding the Association. (Apply to Oliver G. Pratt, Secretary-Treasurer of the Association, Salem, Mass.)

Suggested Tests for Senior Account Clerk.—In the May, 1926, issue of Public Personnel Studies. 10 quarto pp. Practically all of the material given in the tests has been used in selecting persons seeking account clerk work, either in the public service or in industry, and is believed to represent the best civil service, industrial, and psychological practice. 35 cents. (Apply to Bureau of Public Personnel Administration, Institute for Government Research, 26 Jackson Place, Washington, D. C.)

Experimental Impact Studies on Highway Bridges.—By Almon H. Fuller, Professor of Civil Engineering, and Robt. A. Caughey, Associate Professor of Structural Engineering, Iowa State College. Bulletin 75 of the Engineering Experiment Station of the College. December 23, 1925. 61 pp. Views, tables, diagrams. A report of the results of a cooperative research investigation conducted by the Iowa Engineering Experiment Station, the U. S. Bureau of Public Roads, and the Iowa State Highway Commission. (Apply to the Engineering Experiment Station, Iowa State College, Ames, Iowa.)

Reports of Committees of the National Fire Protection Association.—These reports were sent out in advance of the annual meeting of the Association, held at Atlantic City, N. J., May 10-13, 1926. They are: Dust Explosion Hazards; Safety to Life, presenting Building Exits Code; Specifications for Fire Tests of Building Construction and Materials; Laws and Ordinances—Proposed Revision of Suggested Ordinance Regulating the Use, Handling, Storage and Sale of Flammable Liquids and the Products Thereof; Signaling Systems—(1) Protective Signaling Systems, (2) Municipal Fire Alarm Systems. (Apply to the Association, 40 Central Street, Boston, Mass.)

Potable Waters of the State of New Jersey in Their Relation to Health.—By Clyde Potts, C. E., President of the New Jersey State Department of Health. 3 pp. A brief analysis of the police powers of the State Department of Health in matters relating to potable waters and sewage disposal. A table is given showing the typhoid death-rate compared with water supplies from surface sources at five-year periods beginning with 1890, also for 1923. (Apply to the author, 30 Church Street, New York.)

The Highways of Jackson County, Mo.—Report on the County Highway Department and County Road System of Jackson County. Prepared by the Kansas City Public Service Institute, 501 Orear-Leslie Building, Kansas City, Mo. March, 1926. VIII + 52 mimeographed pp. Maps, charts, tables. An inquiry as to the present road system of the county, its cost and the cost of maintenance, the type of roads and the type of road work being done, and the extent to which the present work is adequate. The study was made during the winter months of 1925 and 1926 and is based on an examination of the road laws, partial inspection of the roads, analysis of records, anlysis of the organization, and conferences with officials and employees; it will be supplemented this summer by observation of road forces actually at work. (Apply to Wm. B. Henderson, Chairman of the Institute.)

The Sanitary District of Chicago.—Chief Engineer's Report and Recommendations to the Board of Trustees for the Year 1926. 77 pp. Photographs, folding map. Giving statements of the work under contract at the end of 1925 upon which existing obligations must be met during 1926, and other work which should be let to complete projects under way; also new projects which should be started, and new projects available for development. (Apply to E. J. Kelly, Chief Engineer, The Sanitary District of Chicago, Chicago, Ill.)

Reports Received

BALTIMORE, MD.—Annual Report, Free Public Bath Commission, 1925.

DULUTH, MINN.—Annual Report, Water and Light Department, 1925.

FREDERICKSBURG, VA.—Annual Report on the Fiscal Affairs of the City, 1925.

GODERICH, ONT.—Auditor's Financial Statement, 1925.

GREENWOOD, S. C.—Annual Reports, Town Council and Water and Electric Light Plant, 1925.

KALISPELL, MONT.—Annual Report, Water Department, 1925.

MCPHERSON, KANS.—Annual Report of City, 1925.

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ST. PAUL, MINN.—Annual Report, Bureau of Civil Service, 1925.

SALEM, MASS.—Annual Report, Park Department, 1925.

SALT LAKE CITY, UTAH.—Annual Report, City Engineer, 1925.

SOUTH CAROLINA.—Annual Report, State Board of Public Welfare, 1925.

SPOKANE, WASH.—Annual Report, City Auditor, 1925.

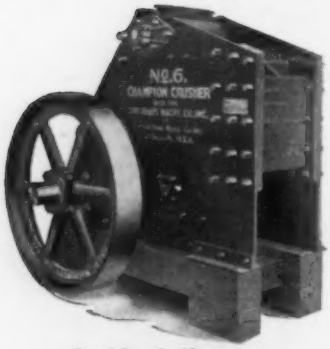
SPRINGFIELD, MASS.—Annual Report, Water Commissioners, 1925.

WAKEFIELD, MICH.—Annual Report, Department of Accounts and Finance: Budget, 1926; Expense, 1925.

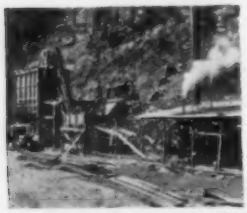
WESTMOUNT, QUE.—Annual Reports of City, year ending October 31, 1925.

Good Roads Portable Rock Crushing Plant used by town of Warwarsing, New York

Easy to set up . . . to operate . . . to move



Good Roads Champion Rock Crusher No.6



No. 6 Champion Rock Crushing Plant of John J. Guinan Contracting Co., Brooklyn, N.Y. Plant used in State Highway construction work.

Good Roads Portable Rock Crushing Plants are ideal for towns—townships—counties, and contractors. The ease with which they can be set up, operated, and moved, together with their all-around efficiency insures the most economical and practical results. They allow townships and boroughs to keep within their appropriations, and contractors to increase their profits.

Good Roads Portable Rock Crushing Plants

Good Roads Portable Rock Crushing Plants are made in two types — Champion and Climax — consisting of Rock Crusher, Mounting Elevator, Revolving Screen, and Bin. Portable plants are made in various sizes up to 300 tons daily capacity. These outfits are models of convenience and thousands are now in use, making profits for contractors and saving money for tax payers. Our Crusher Catatog K. A. U. gives detailed information. Write for it today!

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GOOD ROADS MACHINERY CO., Inc.
KENNETT SQUARE, PENNA.

EVERYTHING FOR THE ROAD MAKER

Road Graders
Road Drags
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Heating Kettles
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Steam Road Rollers
Tandem Rollers
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Corrugated Culvert Pipe
Gravel Screening Plants
Car Unloaders
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Good Roads MACHINERY

On the Calendar of Conventions

JUNE 3-5.—WILLIAMSPORT, PA.
Pennsylvania Commercial Secretaries Association. Mid-year meeting. Secretary-Treasurer, Raymond Woodrum, Chamber of Commerce, Norristown, Pa.

JUNE 5-7.—BUFFALO, N. Y.
Conference of State Sanitary Engineers. Annual meeting. Secretary-Treasurer, Arthur P. Miller, Assistant Sanitary Engineer, U. S. Public Health Service, Washington, D. C.

JUNE 7-11.—BUFFALO, N. Y.
American Water Works Association. Annual meeting. Sec., Beekman C. Little, 43 City Hall, Rochester, N. Y.

JUNE 8-11.—TULSA, OKLA.
National Association of Real Estate Boards. Annual convention. Executive Secretary, Herbert U. Nelson, 310 South Michigan Avenue, Chicago, Ill.

JUNE 9-12.—LOS ANGELES, CALIF.
National Association of Purchasing Agents. Annual convention and Informashow. Secretary, W. L. Chandler, Woolworth Building, New York.

JUNE 12-18.—PHILADELPHIA, PA.
American Association of Engineers. Annual convention. Acting Secretary, Miss M. E. McIver, 63 East Adams Street, Chicago, Ill.

JUNE 13-18.—ON BOARD S. S. RICHELIEU, MONTREAL TO HA! HA! BAY.
Union of Municipalities of the Province of Quebec. Annual convention. Secretary, R. Prieur, 326 Transportation Building, Montreal, Que.

JUNE 14-16.—HOT SPRINGS, ARK.
National Conference on State Parks. Annual meeting. Secretary, Beatrice M. Ward, 905 Union Trust Building, Washington, D. C.

JUNE 14-18—DENVER, COLO.
Rotary International. Annual convention. Secretary, Chesley R. Perry, 221 East 20th Street, Chicago, Ill.

JUNE 16-18.—SCHENECTADY, N. Y.
Conference of Mayors and other City Officials of the State of New York. Annual conference. Secretary, William P. Capes, City Hall, Albany, N. Y.

JUNE 16-18.—LA CROSSE, WIS.
League of Wisconsin Municipalities. Annual convention. Secretary, Ford H. McGregor, Madison, Wis.

JUNE 18-19.—DAYTON, OHIO
Ohio Commercial Secretaries Association. Annual meeting. Secretary-Treasurer, S. N. Vaughn, Chamber of Commerce, Mansfield, Ohio.

JUNE 21-23.—STROUDSBURG, PA.
Pennsylvania State Association of Boroughs. Annual convention. Secretary, J. Herman Knisely, Capitol Building, Harrisburg, Pa.

JUNE 21-25.—ATLANTIC CITY, N. J.
American Society for Testing Materials. Annual meeting. Secretary, C. L. Warwick, 1315 Spruce Street, Philadelphia, Pa.

JUNE 22-24.—VIRGINIA, MINN.
League of Minnesota Municipalities. Annual meeting. Executive Secretary, Morris B. Lambie, University of Minnesota Library, Minneapolis, Minn.

JUNE 22-24.—MANCHESTER, N. H.
New England Association of Fire Chiefs. Annual convention. Sec., Chief John W. O'Hearn, Watertown, Mass.

JUNE 23-25.—SWIFT CURRENT, SASK.
Union of Saskatchewan Municipalities. Annual convention. Secretary, W. E. Hodge, 227 Main Street, Moose Jaw, Sask.

JUNE 25-26.—PORTSMOUTH, N. H.
New England Association of Commercial Executives. Annual meeting. Secretary, W. J. Warren, Chamber of Commerce, Waltham, Mass.

JUNE 28-29.—WAUSAU, WIS.
Wisconsin Association of Commercial Secretaries. Annual meeting. Sec.-Treas., Lee I. Yorkson, Wausau, Wis.

JUNE 28-JULY 1.—SAN FRANCISCO, CALIF.
American Society of Mechanical Engineers. Spring meeting. Sec., Calvin W. Rice, 29 W. 39th St., New York.

JUNE 28-JULY 1.—MILWAUKEE, WIS.
Smoke Prevention Association. Annual convention. Secretary, Frank A. Chambers, Room 1411, City Hall, Chicago, Ill.

JULY 14-16.—SEATTLE, WASH.
American Society of Civil Engineers. Summer meeting. Secretary, George T. Seabury, 33 W. 39th St., New York.

JULY 19-22.—CHICAGO, ILL.
International Association of Chiefs of Police. Annual convention. Secretary, George Black, Chief of Police, Wilmington, Del.

JULY 20-22.—KANSAS CITY, MO.
National Association of Comptrollers and Accounting Officers. Annual meeting. Secretary, Mark M. Foote, 501 City Hall, Chicago, Ill.

JULY 22-24.—LUBBOCK, TEX.
Texas Commercial Executives' Association. Annual conference-school. Secretary, Jelks F. Castellaw, Ennis, Tex.

JULY 26-28.—CHEYENNE, WYO.
Governors' Conference. Annual conference. Secretary, Cary A. Hardee, Live Oak, Fla.

AUGUST 3-5.—LONDON, ONT.
Union of Canadian Municipalities. Annual meeting. Secretary, S. Baker, City Clerk, London, Ont.

AUGUST 16-28.—EVANSTON, ILL.
National School for Commercial and Trade Executives. Address—John N. Van der Vries, Chamber of Commerce of the United States, 801 Otis Building, Chicago, Ill.

AUGUST 25-27.—HALIFAX, N. S.
Union of Nova Scotia Municipalities. Annual convention. Sec., Arthur Roberts, Bridgewater, Nova Scotia.

AUGUST 31-SEPTEMBER 2.—HAZLETON, PA.
Association of City Planning Commissions of Cities of the Third Class in Pennsylvania. Fall convention. Address: Department of Internal Affairs, Bureau of Municipalities, Harrisburg, Pa.

AUGUST 31-SEPTEMBER 2.—HAZLETON, PA.
League of Cities of the Third Class in Pennsylvania. Annual convention. Secretary, Fred H. Gates, City Clerk, Wilkes-Barre, Pa.

SEPTEMBER 6-13—MILAN, ITALY
International Road Congress. Secretary, General M. LeGavrian, Permanent International Association of Road Congresses, 1 Avenue d'Iena, Paris, France.

SEPTEMBER 7-10.—SPRING LAKE, N. J.
Illuminating Engineering Society. Annual convention. Gen. Secretary, L. H. Graves, 31 W. 40th St., New York.

SEPTEMBER 13-14.—VIENNA, AUSTRIA
International Conference on Housing and Town Planning. Address—H. Chapman, Organizing Secretary, International Federation for Town and Country Planning and Garden Cities, 3 Gray's Inn Place, London, W. C. 1, England.

SEPTEMBER 14-17.—PROVIDENCE, R. I.
New England Water Works Association. Annual convention. Secretary, Frank J. Gifford, 715 Tremont Temple, Boston, Mass.

SEPTEMBER 21-24.—ASHEVILLE, N. C.
International Association of Municipal Electricians. Annual convention. Sec. E. H. Benz, Municipal Bldg., West New York, N. J.

SEPTEMBER 28-OCTOBER 1.—WASHINGTON, D. C.
American Society of Sanitary Engineering. Annual meeting. Secretary, James R. Walker, 105 Cummings Street, Boston 18, Mass.

OCTOBER 11-14.—BUFFALO, N. Y.
American Public Health Association. Annual meeting. Secretary, Homer N. Calver, 370 7th Ave., New York.

OCTOBER 18-22.—ATLANTIC CITY, N. J.
Playground and Recreation Association of America. Annual Recreation Congress. Secretary, H. S. Braucher, 315 Fourth Avenue, New York.

OCTOBER 19-22.—NEW ORLEANS, LA.
International Association of Fire Engineers. Annual convention. Secretary, James J. Mulcahey, City Hall, Yonkers, N. Y.

OCTOBER 24-27.—PITTSBURGH, PA.
National Association of Commercial Organization Secretaries. Annual meeting. Secretary-Treasurer, Walter O. Lochner, Chamber of Commerce, Trenton, N. J.

OCTOBER 25-28.—HOUSTON, TEXAS
American Institute of Park Executives and American Park Society. Annual convention. Executive Secretary, Will O. Doolittle, Box 432, Rockford, Ill.

OCTOBER 25-29.—DETROIT, MICH.
National Safety Council. Annual Safety Congress. Dir., W. H. Cameron, 168 N. Mich. Ave., Chicago.

NOVEMBER 8-12.—WASHINGTON, D. C.
American Society for Municipal Improvements. Annual convention. Secretary, C. W. S. Sammelman, 3817 Olive Street, St. Louis, Mo.

January's "Caterpillar" at June Tasks

PUSHING a plow in the winter; pulling a grader in summer—"Caterpillar" Tractors supply year 'round power for road construction and maintenance.

Buy it for snow removal; use it for smoothing streets or building new roads—every tax payer and motorist learns to look kindly on the powerful "Caterpillar" that gives him better roads through all the year.

CATERPILLAR TRACTOR CO.

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News and Illustrations

Items of Interest to City, Town and County Officials, and Others Concerned with the Economical Construction and Efficient Operation of Public Improvement Undertakings

London Guards Against Oil Conflagrations

With the increasing use of oil and other inflammable liquids and the consequent frequent need for storing them in industrial and thickly populated districts, the provision of adequate apparatus for handling large oil fires has become a matter for serious consideration in a growing number of communities. An important step in this direction has been taken by the city of London, England, in recently adding to the equipment of its Fire Brigade what is believed to be the first piece of motor-driven apparatus designed solely for fire extinction by the Foamite method to be put into service in that country.

London's new apparatus, of which a photograph is here reproduced, was supplied by the Tilling-Stevens Motors, Ltd., and comprises one of that company's T. S. 4 petrol-electric 50-60-horsepower chassis equipped with Foamite Firefoam apparatus. With a wheelbase of 14 feet 6 inches, the chassis is practically of standard type. Mounted on three steel cradles and held by steel straps, the Firefoam-producing apparatus is contained in a 600-gallon tank divided into two 300-gallon compartments. The rear compartment is lead-lined and holds an acid solution, and an alkaline solution is carried in the forward tank. The two solutions are led by separate pipes to two special positive displacement pumps operated by electric current from the chassis dynamo. These pumps have a maximum output of 40 gallons a minute. The 600 gallons of solutions produce about 5,000 gallons of Firefoam, which can be thrown in the form of a jet to a maximum of 80 feet. The equipment of the machine also includes four Foamite 2-gallon hand extinguishers for use in small outbreaks or in preventing a fire from spreading.

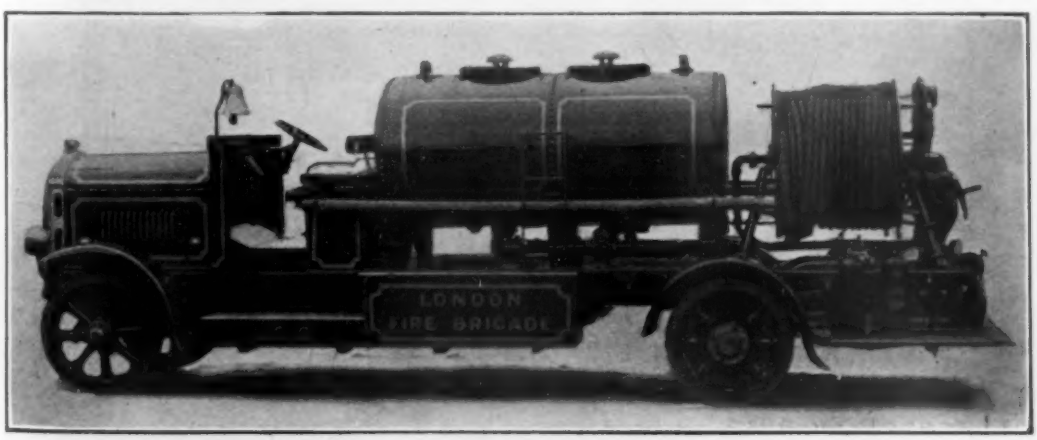
This apparatus was utilized with marked success at its first real test by the London Fire Brigade, when the Firefoam quickly extinguished a fire resulting from the ignition of two tanks of spirits in an oil store. In a later instance, a van-load of paraffin which had burst into flames on a suburban highway blazed unchecked until the new apparatus arrived and successfully dealt with the outbreak.

Distinctive Features of 300-B.H.P. Diesel Engines

The Fulton Iron Works Company, St. Louis, Mo., has developed a new frame and other improvements which have been incorporated in Fulton diesel engines ranging in size from 300 to 2,000 b. h. p. The most distinctive part of this new design is the application of the en bloc cylinder casting, which is so widely used in the automobile engine, to diesels over 300 b. h. p. rating. In this construction, it is claimed by the manufacturers that stiffness and rigidity of the entire unit is secured, which is impossible with the conventional shallow box frame and individual bolted-on cylinders.

Large doors on both sides of the frame give ready access to all main and connecting rod bearings. These bearings, as well as the piston pins, are lubricated by a positive circulating pressure feed system. Exceptionally large crankshafts have been used in these new en bloc frame engines. For instance, an 11-inch shaft is used for engines having 100-horsepower per cylinder rating.

The engines are started by means of a low air pressure starting system, the air being admitted into all cylinders of the engine up to and including the 6-cylinder type and into 6 cylinders of the 8- and 10-cylinder engines. It is claimed that the usual high strain imposed on the crankshaft in starting with high air pressure has been eliminated,



PETROL-ELECTRIC FOAMITE FIRE ENGINE, LONDON, ENGLAND

Portland Cement Concrete Is the Aristocrat of Paving

Los Angeles Tunes in on the Voice of Destiny

From one end of the state to the other, Destiny is broadcasting a warning to the thriving, fast-growing cities of California.

It is telling these cities that new and greater floods of traffic are on the way, and that to withstand this traffic, sturdy streets must be built—and built now.

Among alert communities giving ear to this warning is Los Angeles.

Los Angeles already has more concrete streets than any other city in the country, and is extending its mileage of this permanent type every year.

One of the most important for 1926 construction is Pico Boulevard.

When completed this will be one of the best paved streets on the Pacific Coast.

It has been designed for modern traffic in accordance with advanced practice of highway building. Width will be from 34 to 68 feet, and its seven mile stretch is to be paved entirely with portland cement concrete.

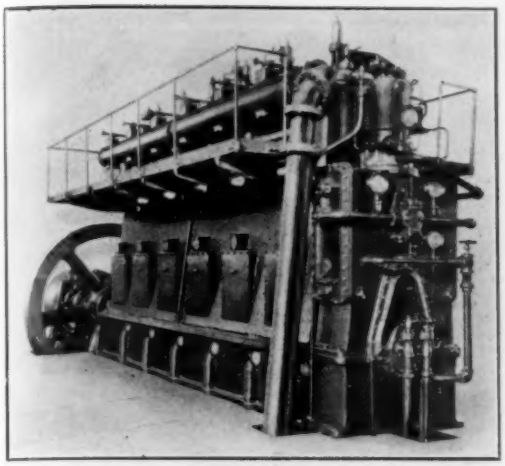
Other California towns and cities can make large savings on paving construction and repair during the years ahead by following the example of Los Angeles.

Property owners and local authorities can get the detailed story of Los Angeles' plan of modern paving by writing nearest office listed below. Also ask for your copy of our free booklet on "Concrete Streets."

PORTLAND CEMENT ASSOCIATION

A National Organization to Improve and Extend the Uses of Concrete

Atlanta	Denver	Lincoln, Nebr	Oklahoma City	Salt Lake City
Birmingham	Des Moines	Los Angeles	Parkersburg	San Francisco
Boston	Detroit	Milwaukee	Philadelphia	Seattle
Chicago	Indianapolis	Minneapolis	Pittsburgh	St. Louis
Columbus	Jacksonville	Nashville	Portland, Oreg.	Vancouver, B. C.
Dallas	Kansas City	New Orleans	Richmond, Va.	Washington, D. C.
		New York		



A 6-CYLINDER, 600-BRAKE-HORSEPOWER FULTON DIESEL ENGINE

and it is also possible to maintain a low-pressure auxiliary pumping unit, if desired in the single-engine stations.

Water-cooling of the cylinder lining throughout its entire length is another feature, while large hand holes on either side give ready access to the water-jacket for cleaning. A feature in cylinder head cooling which has given exceptional results is used. By means of a short pipe all water entering the cylinder head is projected against the center portion of the head around the intake, exhaust and fuel valves, effectively cooling this portion which is subject to the highest temperatures, and thereby maintaining an even temperature distribution over the entire cylinder head, eliminating unusually high stresses in the casting which might otherwise be developed.

In general details of construction the engine adheres to well-known Fulton features. The 4-cycle principle with the air injection of fuel is maintained. The unit system of control has been continued with air-operated starting valves. This gives a symmetrical cylinder head design and permits placing the starting valve away from the opening for the intake, exhaust and fuel valves. Such features as pistons, valves and valve-operating mechanism remain the same as they are on the other types of Fulton engines. The same cylinder dimensions and conservative ratings are still used.

Admixture Insures Water-Tightness of Concrete

The concrete work of the new water treatment and purification plant for the city of Springfield, Ill., designed by Burns & McDonnell Engineering Company, Kansas City, Mo., for which Cope & Fisher were contractors, was made water-tight through the use of Celite made by the Celite Products Company, Chicago, Ill On this job 3 per cent of Ce'ite by weight of cement was used as an admixture in a 1:2:4 mix. The Celite resulted in a very workable mixture without the need of excess water. No segregation was encountered on this job, and as the forms were removed it was found that the concrete had set up with a finish of excellent texture and a high degree of water-tightness.

Watson and Rex Consolidate

Announcement has been made of the consolidation of the Watson Truck Corporation and the Rex Engineering Corporation, under the name The Rex-Watson Corporation, Canastota, N. Y. This corporation will manufacture the former line of Watson bottom-dumping wagons, tractor wagons and trailers, as well as the former line of Rex baling machines for compressing paper, cotton, metal and other materials. The officers of the new company are Charles Van Zandt, President; Robert Love, Vice-President; H. J. Clark, Treasurer, and Charles R. Chapman, Secretary.

New Westinghouse Managers

The Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., through its Vice-President and General Sales Manager, E. D. Kilburn, has announced that J. McA. Duncan, for fourteen years Pittsburgh District Manager, has been promoted to Assistant General Sales Manager of the company. W. R. Marshall, formerly Branch Manager at Buffalo, has been selected to assume the duties of Pittsburgh District Manager.

In addition to these appointments, H. F. Boe, formerly Industrial Division Manager at Buffalo, has been promoted to Branch Manager of that office, and R. L. Kimber to Industrial Division Manager. W. F. Barnes has been appointed Branch Manager of the Tulsa office of the company.

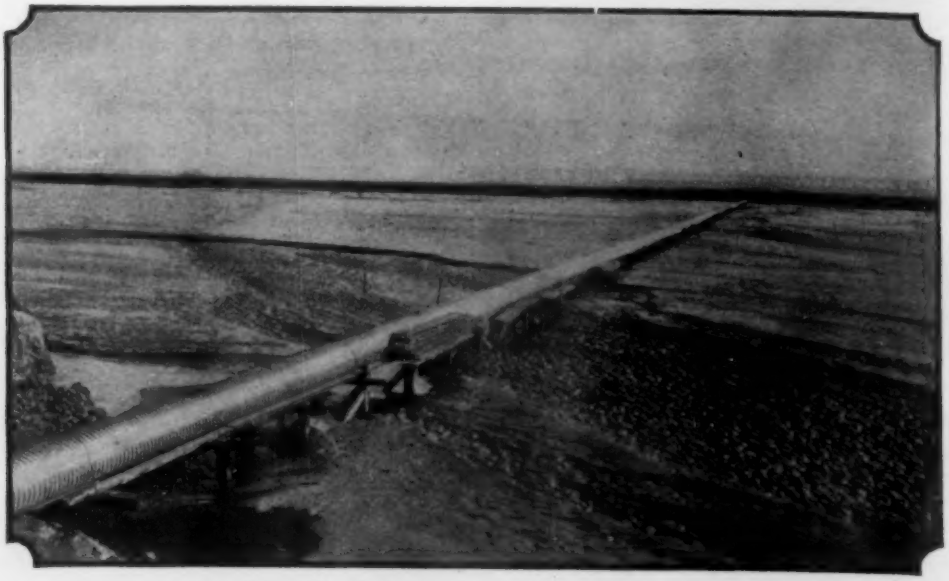
Leavitt & Son Move New York Office

Charles Wellford Leavitt & Son, civil and landscape engineers, have announced the removal of their offices to 285 Madison Avenue, at 40th Street, New York City.

New Sullivan Chief Engineer

The Sullivan Machinery Company, 125 South Michigan Avenue, Chicago, Ill., has announced the appointment of Charles B. Officer, hitherto assistant to the President on engineering matters, as Chief Engineer of the company in charge of engineering with regard to new machinery or changes in existing designs.

VIEW OF THE SPRINGFIELD, ILL., WATER-WORKS, SHOWING CONCRETE WATERPROOFED WITH CELITE



A valuable industrial site was produced at Los Angeles, Calif., by filling in over this Armco storm drain and the mud flat on which it was laid.

When Water Stands in the Way of Your City's Progress

When better drainage is needed for your city's progress, Armco storm drains provide the logical solution.

Once an Armco corrugated iron pipe drain has been placed, the need which made its use necessary will be forgotten.

Armco pipe successfully resists strains from weight of fill, impact of traffic and stresses caused by settling or shifting soils. Equally important, it will resist the effect of freezing air drafts which frequently—in cold climates—result in fracture of the brittle pipe near the outlet regardless of the depth of the frost line.

A new bulletin, "Increasing the Efficiency of Roadbed Drainage" gives full information about the use of Armco pipe for storm drains and many other municipal purposes—for parks, for golf courses, for athletic field uses, for drainage under streets, etc. Copy on request.

ARMCO Ingot Iron

ARMCO CULVERT & FLUME MFRS. ASS'N
MIDDLETOWN, OHIO

ARMCO CULVERTS

Consistent Performance—Because of Consistent Uniformity

ONE-TON INTERNATIONAL TRUCKS WITH TRAILERS DUMPING GARBAGE AT DISPOSAL PLANT, MINNEAPOLIS, MINN.

One-Ton Trucks and Trailers Speed Garbage Collection

Garbage collection is always a big, expensive job, and many are the plans and devices for performing it. The city of Minneapolis makes interesting use of special short-wheelbase, Model-SD one-ton motor trucks and trailers made by the International Harvester Company of America, 606 South Michigan Avenue, Chicago, Ill., equipped with removable steel tanks to speed its garbage collections. One of the outfits is shown in an accompanying illustration, with tank fully loaded.

The motor trucks bring the tanks loaded with garbage to a central unloading station, where a crane lifts the tanks as shown in one of the illustrations, and transfers them to a large heavy-duty truck, which in turn hauls seven of these tanks at a time to an incinerating plant six miles away. The tanks are lifted by means of four hooks, two of which are at each end. By this arrangement, of course, little time is lost in unloading, the loaded tank being quickly removed and an empty one put in its place.

Shedd with Federal Meter

The Federal Meter Corporation, 275 North Arlington Avenue, East Orange, N. J., has announced that Edward Shedd, formerly connected with the Thomson Meter Company, is now associated with the sales force of the Federal Meter Corporation and will cover the New England territory. Mr. Shedd covered this territory for a period of about 20 years for the Thomson Company and is very well known throughout the territory.

Warren Brothers Move Office

Warren Brothers Company has announced the removal of its executive offices and laboratory to 38 Charles River Road, Cambridge, Mass.; telephone, Porter 4321, and mail address, P. O. Box 1869, Boston, Mass. The new office is quite near the plant and also near the Kendall Square Station of the Cambridge subway.

Mathieson Alkali Appointments

The Mathieson Alkali Works, Inc., 250 Park Avenue, New York City, has announced the appointment of William A. Field, formerly located in the St. Louis territory, as Chicago District Sales Manager, with offices at 310 South Michigan Avenue, Chicago, Ill. Mr. Field succeeds J. B. Peake, who has resigned. Frederick H. Lovenberg, formerly attached to the New York sales office, has been placed in charge of a St. Louis district sales office.

Announcement has also been made of arrangements which have been completed with the Fields Point Manufacturing Corporation, Providence, R. I., which will afford the latter corporation the general support and extensive resources of the Mathieson Alkali Works for the benefit and service of New England customers of both companies. Effective April 1, Daniel Townend, President of the Fields Point Manufacturing Corporation, has taken charge of the sales of both companies' products in the New England territory under the direction of the Mathieson general sales offices in New York. The New England district sales offices will be maintained as before at 911 Rhode Island Hospital Trust Building, Providence, R. I.

A new booklet that tells the facts about CONCRETE CURING

JUST published! A new Solvay booklet that gives you the complete story, the very latest information about concrete curing with Calcium Chloride.

Here you will find authoritative specifications for surface application and for integral use—charts, tables and photographs that prove the value of Calcium Chloride as the superior curing agent.

SOLVAY CALCIUM CHLORIDE

Every engineer, contractor and road official needs this booklet. And it's free—just send in the coupon—do it now!

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THE AMERICAN CITY

THE LA MOTTE COMPARATOR FOR HYDROGEN-ION CONCENTRATION TESTS

Hydrogen-ion Concentration Tests Made Easier

Technical men in the water-works field are almost unanimous in their agreement that the hydrogen-ion concentration test has been one of the greatest developments in determining quickly and effectively the proper method of dosing water with chemicals to give the best results with the least application of chemicals. To facilitate these tests, which were at first considered exceedingly difficult, the LaMotte Chemical Products Company, McCormick Building, Baltimore, Md., has developed comparator sets which make the test very easy to use by non-technical water-works employees.

The latest development is the roulette comparator, which covers an extended range of hydrogen-ion concentration, gives the maximum of simplicity, accuracy, and speed in making the determination, and may be easily carried to different parts of the laboratory or plant, as required. This comparator consists of a stationary base and metal band and a wooden drum which revolves inside the metal band on ball bearings. A 40-watt mazda lamp is fixed in the middle of the base and is connected with a standard electric plug by means of a lamp cord. The block, which contains three slots and which is drilled to hold three graduated test tubes, is fastened to the front of the metal band. A piece of etched glass is placed in a holder between the lamp and the test tube block to give a uniformly diffused light. A piece of Daylite glass is fixed in the test tube block, as with this arrangement the same standard daylight conditions are obtained at all times for the tests.

Three sets of color standards having ranges in the hydrogen-ion concentration scale from 5.2 to 6.8, from 6.0 to 7.6, and from 6.8 to 8.4, and 27 ampoules of distilled water, are supplied with the set. An extra polished wooden case, containing three 50-c. c. bottles of the corresponding indicator solutions, three 0.5-c. c. pipettes, and eighteen graduated test tubes, is also included as part of the equipment.

In the operation of the roulette comparator, three sets of color standards are placed in the holes in the revolving drum, the color standards alternating with ampoules of distilled water. To make a determination, the three test tubes in the block are filled to the 10-c. c. mark with the solution to be tested. Then, ½-c. c. of the proper indicator solution is added to the middle tube, and the tube is shaken to insure thorough mixing. The drum is then revolved until the color standards made from the same solution are directly behind the test sample, the standards being turned until an exact match with one of the standards is obtained or until the color of the test sample lies between the colors of the standards on either side of it. The hydrogen-ion concentration value, known as the pH value, can then be read off directly from the color standards, as the labels on the standards project above the top of the drum.

If the pH value lies in the range of another indicator, the same procedure is followed, adding the proper indicator to another test sample and revolving the drum until the corresponding color standards are in position for comparison.

Control for Reservoir Pumps

An interesting system of pump motor control was recently devised by the General Electric Company, Schenectady, N. Y., for controlling an installation of three squirrel cage pumps motors used to maintain the water-level in a reservoir. It was desired that standard automatic starting compensators be used with an auxiliary control which would give six combinations of the pump motors for six different levels of the water in the reservoir. It was further desired that but one of the pumps operate during certain periods of time, the other two automatically shutting off to start again only at the end of the shut-down period.

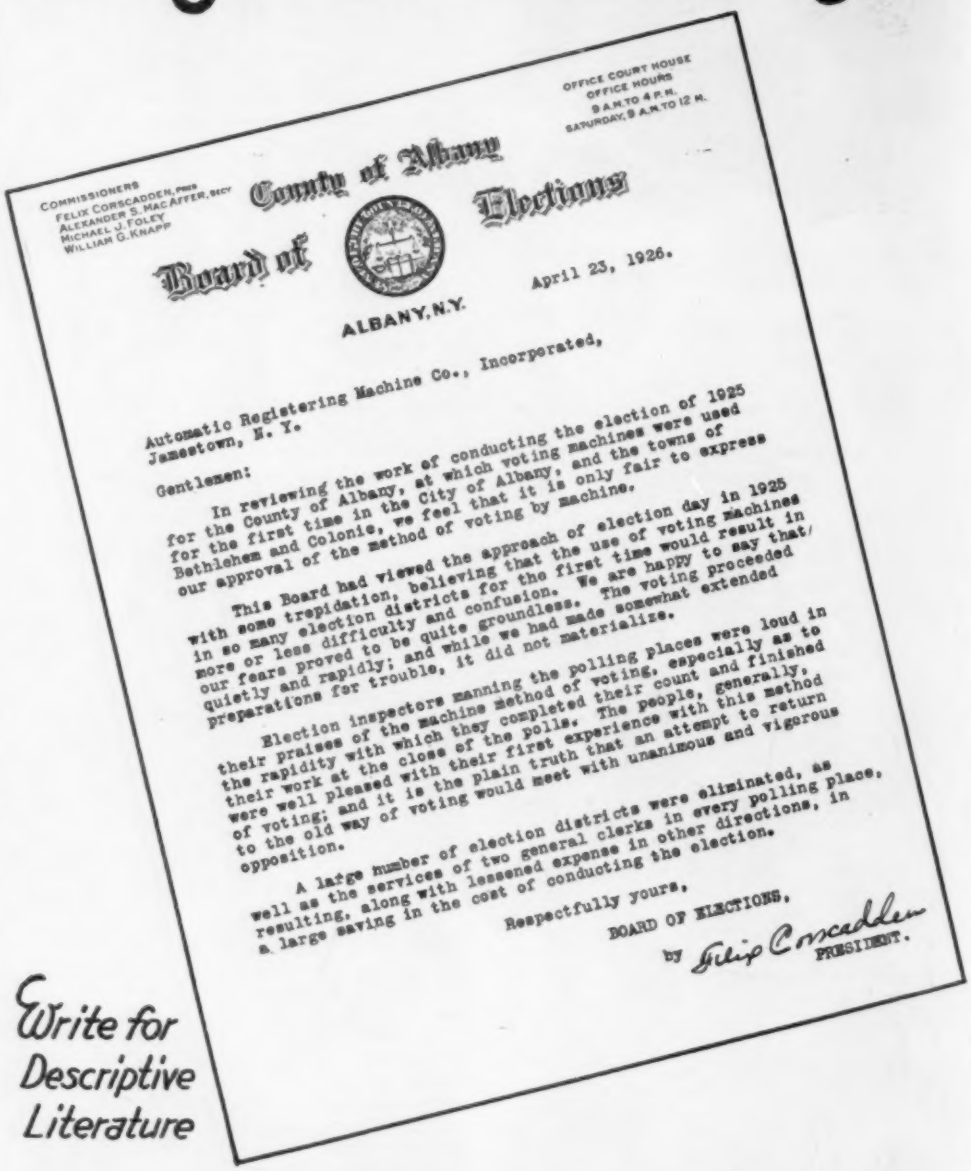
In view of the fact that ice would foul the mechanism of a float switch during the winter months, it was decided to use a Ruggles-Klingemann regulator panel having six control points, each point to represent a definite level of the water in the reservoir.

There were mounted on the panel the regulator, a dial switch, a control circuit switch, a time switch with 6 points, a field control switch with contactors. Rather than make up a new dial switch, and seven double-pole controlled relaying 21 buttons was utilized, the 6 points being obtained by wiring the 21 buttons into 7 groups of 3 buttons each.

In operation, the water dropping in the reservoir causes the regulator to operate, moving the dial switch to the first control point, actuating contactor No 1 and starting pump motor No. 1 by means of the first automatic compensator. As the water-level continues to drop, additional contactors up to the sixth are actuated. The first pump motor is rated at 60-horsepower, the second 100-horsepower, and the third 150-horsepower. As each pump goes into operation on the first three points of the dial switch, the preceding one drops out, but No. 3 continues to operate on the fourth, fifth, and sixth points, and additional pumps are picked up on each point. On the fourth point pump No. 1 is added, on the fifth point pump No 1. drops out and pump No. 2 is picked up, and on the sixth point all three pumps go into operation.

In order to provide operation of but one of the pumps for certain periods of time, a time switch and one of the control relaying contactors were used. The normally closed tips of the time switch

Voting Machines in Albany, N.Y.



COMMISSIONERS
FELIX CORSCADDEN, Pres
ALEXANDER S. MACAFFER, Sec'y
MICHAEL J. FOLEY
WILLIAM G. KNAPP

OFFICE COURT HOUSE
OFFICE HOURS
9 A.M. TO 4 P.M.
SATURDAY, 9 A.M. TO 12 M.

County of Albany
Board of Elections

ALBANY, N.Y. April 23, 1926.

Automatic Registering Machine Co., Incorporated,
Jamestown, N. Y.

Gentlemen:

In reviewing the work of conducting the election of 1925 for the County of Albany, at which voting machines were used for the first time in the City of Albany, and the towns of Bethlehem and Colonie, we feel that it is only fair to express our approval of the method of voting by machine.

This Board had viewed the approach of election day in 1925 with some trepidation, believing that the use of voting machines in so many election districts for the first time would result in more or less difficulty and confusion. We are happy to say that our fears proved to be quite groundless. The voting proceeded quietly and rapidly; and while we had made somewhat extended preparations for trouble, it did not materialize.

Election inspectors manning the polling places were loud in their praises of the machine method of voting, especially as to the rapidity with which they completed their count and finished their work at the close of the polls. The people, generally, were well pleased with their first experience with this method of voting; and it is the plain truth that an attempt to return to the old way of voting would meet with unanimous and vigorous opposition.

A large number of election districts were eliminated, as well as the services of two general clerks in every polling place, resulting, along with lessened expense in other directions, in a large saving in the cost of conducting the election.

Respectfully yours,

BOARD OF ELECTIONS,

by Filip Corscadden
PRESIDENT.

Write for Descriptive Literature

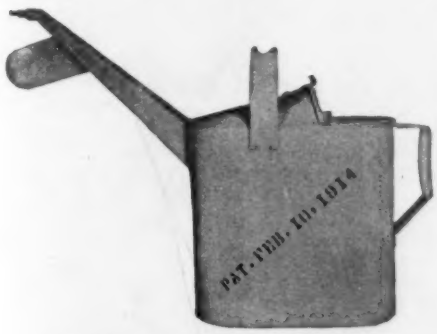
Automatic Registering Machine Co., Inc.
Jamestown, N.Y.

were wired in the coil circuit of the contactor, and the control circuits of the two automatic starting compensator panels were wired through the contactor. During normal operation the contactor is closed and all the pump motors start on their respective points. During the period of shut-down, however, the tips of the time switch open and the contactor drops out As a result, but one pump motor operates, regardless of the position of the dial switch.

A Crack and Joint Filling Pot

A pouring pot with a capacity of four gallons for use in crack and joint filling has been placed on the market by the Tarrant Manufacturing Company, Saratoga Springs, N. Y. This Tarco pot No. 12 is made of heavy sheet iron with all joints and seams oxyacetylene welded, doing away with any possibility of leaks. All material entering the pot is strained through a fine galvanized wire screen, which can be removed and cleaned without delay and without the use of any tools.

The handles are constructed with pressed bosses which prevent the operator from cutting his hand and make the pot much easier to carry. The spreader is made integral with the body and is large enough at this point to allow sufficient material to flow to the nozzle at all times without too great a pressure.



A WELL-BUILT TAR POURING POT

The pot is fitted with two small pipe nipples which screw into each other, thereby giving three sizes of outlets. The two small ones are designed for brick filling or for filling in the joints of asphalt and concrete roads, and the larger for expansion joints. These nipples are easily taken out with the fingers or a pair of pliers, and if worn out or lost can be replaced at small expense.

The front guide is welded to the side of the spout and permits the filling of crevices or joints evenly without depending on the hands or eyes of the operator. This results in a great saving of material and prevents spreading it over pavements where it is not wanted.

Carroll Now at Boston Gamewell Office

The Gamewell Company, Newton Upper Falls, Mass., has announced that William J. Carroll, for seven years Publicity Manager of the company, is now associated with its New England office, 1022 Commonwealth Avenue, Boston, Mass., of which A. D. Wheeler is District Sales Manager.

Westinghouse Appointments

The Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa., through E. D. Kilburn, Vice-President and General Sales Manager, has announced the appointment of T. J. Pace, as Director of Sales. The following appointments made by Mr. Pace are effective immediately:

Supervisor of Developments, T. A. McDowell; Supervisor of Costs, W. C. Koehler; Supervisor Mixed Apparatus Negotiations, C. F. Lloyd; Chief Clerk, M. H. Scott.

Motor Apparatus, O. F. Stroman, Manager; Large Motor, R. O. Watson; Synchronous Motor, C. D. Kester; Medium A. C. Motor, J. R. Olnhausen; Medium D. C. Motor, C. B. Stainback; Motor Generator and Welding, W. H. Reddie; Small Power Motor, D. H. Byerly (East Springfield). Cost, F. W. Horst.

Generating Apparatus, H. W. Smith, Manager; D. C. Power Apparatus, F. J. Lewis; A. C. Power Apparatus, J. A. Brown; Power Transformers, A. P. Bender (Sharon); Cost, S. R. Shave.

Traction Apparatus, A. J. Manson; Heavy Traction, T. C. Wurts; Light Traction, E. A. Palmer; Propulsion, W. B. Bassett; Line Material, L. F. Brahmer; Renewal Parts, A. B. Gibson; Cost, E. P. Gooch.

Switchgear Apparatus, R. A. Neal, Manager; Switchboards and Oil Circuit Breakers, N. S. Taylor; Automatic Switching, R. F. Frenger; Switchboard Devices, T. S. Watts; Cost, H. E. Haldeman.

Distribution Apparatus, G. A. Sawin, Manager; Street Lighting, L. A. S. Wood (South Bend); Porcelain, G. I. Gilchrest (Derry); Insulation, E. H. Ott; Instrument, R. T. Pierce (Newark); Distribution Transformers, A. C. Farmer (Sharon); Meters, S. A. Berger (Newark); Feeder Regulators, C. R. Gilchrest. Protective, P. F. Squier; Cost, I. L. Burkhart.

New Knoxville Quarters for Sullivan Office

The Sullivan Machinery Co., 125 S. Michigan Ave., Chicago, Ill., has announced that its Knoxville office, E. L. Thomas, Manager, has just moved from its old location at 614 Market Street to new and larger offices, Rooms 611-615 General Building, 623 Market Street. The General Building, recently completed, is one of the finest and most convenient office buildings in Knoxville.

A Sanitary Electric Dryer for the Patrons of Swimming Pools

While sanitation, the protection of health and life, is, or should be, the first consideration in the operation of swimming pools; nevertheless operating cost is important and in the minds of some officials takes first place. The investment in towels required for a swimming pool or other large institution catering to the public is a large sum, but the maintenance and replacement is the main item, as it is a continuous, never-ending expense.

One of the principal reasons that swimming pools are not patronized more largely by women is the fear of catching cold by reason of imperfect drying of the hair. The R. B. sanitary electric dryer, made by the H. W. Keebler Manufacturing Company, 422 First Avenue, Pittsburgh, Pa., obviates this by drying the hair in a natural way by purified heated air, making it safe to bathe

BRED IN OLD KENTUCKY

Kentucky—The very word breathes romance. From the early days of Daniel Boone, to the present century, Kentucky is mighty proud of its history and accomplishments. Its highway improvement alone is setting a fast pace other states will find hard to follow.

From narrow mountain trails, and dangerous and tedious to travel, Kentucky is now interlaced with some of the finest highways in America and under a large number of the most important roads will be found a Kenutcky product.

NEWPORT CULVERTS

selected by leading engineers and road builders because of their

STRENGTH *STABILITY* *PERMANENCE*

and easy method of installation.

It will be worth your while to investigate the

LASTING QUALITIES

of

NEWPORT CULVERTS

made of "GOHI" *"Genuine Open Hearth Iron"*

Specify them in future contracts for they mean

LONG SERVICE — LOW COST — MINIMUM UPKEEP

THE NEWPORT CULVERT CO
Newport GOHI Kentucky

Write for descriptive literature and further data.

and go out at any season without danger of catching cold. The same system is applied equally well to the drying of hands. In this dryer a current of filtered air is passed through a compartment supplied with an electric heater. The heated air then passes through a bell-mouthed opening to the hair or the body, and the water is soon completely evaporated, leaving a feeling of exhilaration and cleanliness not experienced when using a series of more or less damp towels.

The R. B. Dryer is made in several standard sizes in complete portable units or may be built to order for large institutions. The stand is neat in appearance, finished in white enamel with polished trimmings.

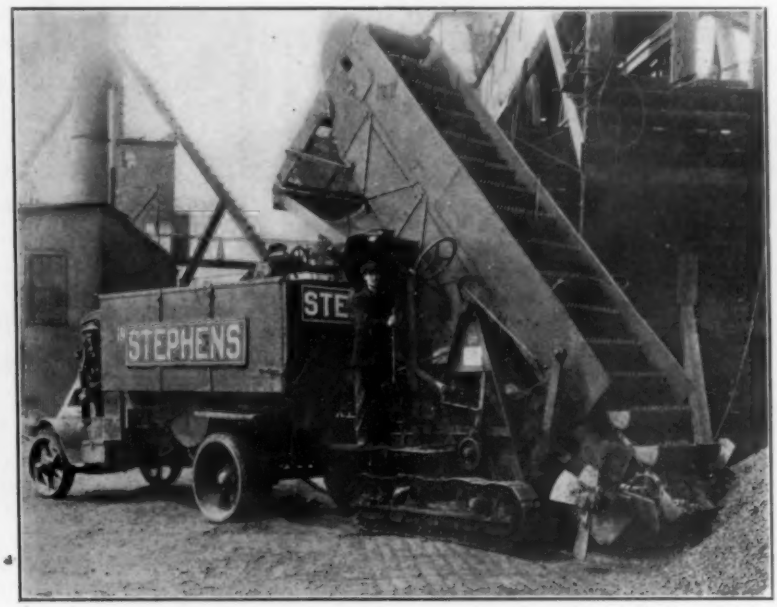
HAIR DRYER ON STANDARD

The adjustable opening, designed with universal connections, permits the air to be directed in any direction. A switch is located at one side, and each stand is furnished with an extension cord for attaching to a standard lamp-socket. The machines are made with one, two, or four openings, but multiple machines of any size or number of openings can be supplied.

A New High-Capacity Loader

The new high-capacity truck loader with a loading capacity of 4 yards per minute, mounted on Caterpillar traction, which has been brought out by the George Haiss Manufacturing Company, 143rd Street and Rider Avenue, New York City, has four strands of chain and two strands of buckets, making a total bucket width of 37 inches. The loader is equipped with a 37-horsepower Waukesha motor and a transmission box which encloses the clutches and gears similar to that used on Haiss path-digging loaders. The tail-shaft is 9 feet long, which means that the loader clears a path that wide. It can be crowded into the pile with the slow-speed mechanism at 39 inches per minute. The elevator unit is pivoted on an A-frame, and is equipped with a raising and lowering device actuated by a hand wheel through a worm and gear jack-knife. This device makes it very easy for one man to raise and lower the elevator as necessary.

One of these machines has recently been purchased by the Stephens Fuel Company, New York City, and is loading material at the rate of 4 yards per minute. The chief demand for this machine is among those contractors who use trucks of 5 yards capacity or over, as it materially reduces the time of loading, over the smaller loaders, and the increase in trips made by the trucks pays for the loader in direct ratio to the number of yards of material loaded per day.



THE NEW HAISS HIGH-SPEED LOADER

CELITE
Insures Better Concrete at Less Cost

Concrete made with Celite is placed with a minimum of labor because of improved workability.

Better Concrete at Less Cost depends upon Increased Workability

Lack of workability in a concrete mixture is usually the cause of non-uniformity in the finished structure. Honeycombing, gravel pockets and porous concrete also are its results.

Much of the manipulation ordinarily required to place concrete can be charged against poor workability. The majority of the troubles encountered in "gunning" and "chuting" concrete are overcome when better workability of the mixture is effected.

The cure for poor workability is not excess mixing water. Workability must be built into the mixture. The only practical and safe method of its attainment is the use of a suitable "workability agent" or admixture.

For this purpose the siliceous admixture *Celite* has been widely used within recent years. Employed in placing pavements, bridges, dams, buildings and foundations, this inactive admixture effects important savings of labor and material while it improves substantially the quality of the final concrete.

An interesting booklet on the application of this workability admixture will be sent on request. Please address our Division Office nearest you.

CELITE PRODUCTS COMPANY

11 Broadway New York
53 W. Jackson Blvd Chicago
1320 S. Hope St Los Angeles
140 Spear St San Francisco
OFFICES AND WAREHOUSES

Celite Products Limited
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Your Private Club in Cleveland

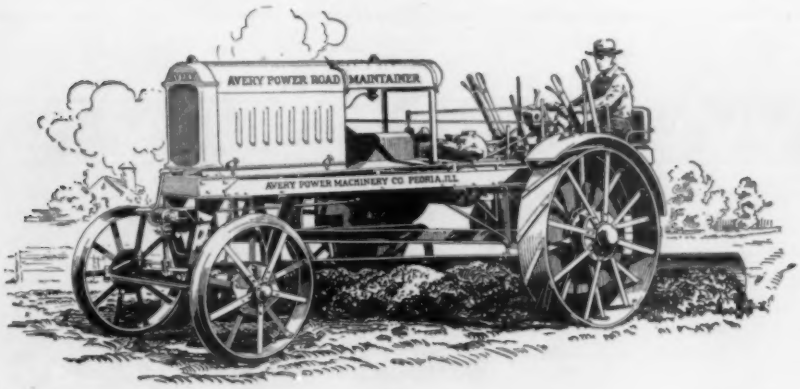
A SPLENDID building, conveniently located, beautifully furnished, offering the comforts and luxuries of the highest class Club, as well as the one thing that makes a Club a Club—a natural exclusiveness that protects the guest from undesirable associations.

All prices at Hotel Cleveland are carefully graded to insure the fullest measure of value for the amounts paid.

Room Rates begin at $3.00 (with bath)

Hotel Cleveland
PUBLIC SQUARE CLEVELAND

Send for New Illustrated Booklet showing advantages of Hotel Cleveland for Conventions.



A NEWLY DEVELOPED ONE-MAN ROAD MAINTAINER

A New Power Road Maintainer

A machine designed to fill the ever increasing demand for a piece of equipment that will maintain dirt and gravel roads and streets, leaving them smooth and properly crowned for drainage, doing the work fast and economically without interfering with traffic, has been announced by the Avery Power Machinery Company, Peoria, Ill. This one-unit maintainer has both the power-plant and the blade on one machine under one man's control.

The maintainer has a 7-foot wheelbase which, combined with automobile-type steering and brakes located on the differential shaft, enables the machine to turn in a 20-foot circle. This is an advantage in working bad pieces of road where several rounds must be made to put them in proper shape. The regular blade is 12 feet 6 inches, but blades 18 feet 2 inches long may be secured as special equipment, making it possible to cover a wide strip of roadway at a time. The blades are raised or lowered instantly by motor power, by simply tripping a conveniently located lever. The machine weighs only 5,000 pounds and has three road speeds—1¾, 2½, and 4½ miles per hour. The motor is a heavy-duty, 4-cylinder Waukesha unit with force feed oiling system and large crankshaft and bearings. All gears are enclosed and run in oil, both front and rear wheels are mounted on Timken taper roller bearings, and the machine is roller and ball bearing equipped throughout. Provision is made for the comfort and convenience of the operator. A spring-mounted platform with cushion seat and back rest is provided, and curved fenders over the drive wheels keep dust and dirt from blowing on the operator. All control levers are in easy reach, and a tool-box which can be locked is furnished.

Small Tractor Performs Many Services in Redondo Beach, Calif.

A Fordson tractor equipped with Trackson Full-Crawler traction and a large fresno has been used by the city of Redondo Beach, Calif., to remove drifted sand from the sidewalks. The tractor has been doing the same work in two days which had required about thirty days for horses, opening up the sidewalks much quicker after a sand storm. Because of its detachable grouters, the Trackson equipment made by the Full-Crawler Company, 518 Clinton Street, Milwaukee, Wis., can be used on the sidewalks without danger of marring them.

The city also uses similarly equipped tractors on the garbage fill. The refuse is buried in trenches 10 feet wide, 3 feet deep and 300 feet long. The ground is plowed first with a rooter plow drawn by the crawler tractor. Then a scraper opens up the ditch. The dirt excavated is used to cover up the tin cans and other refuse.

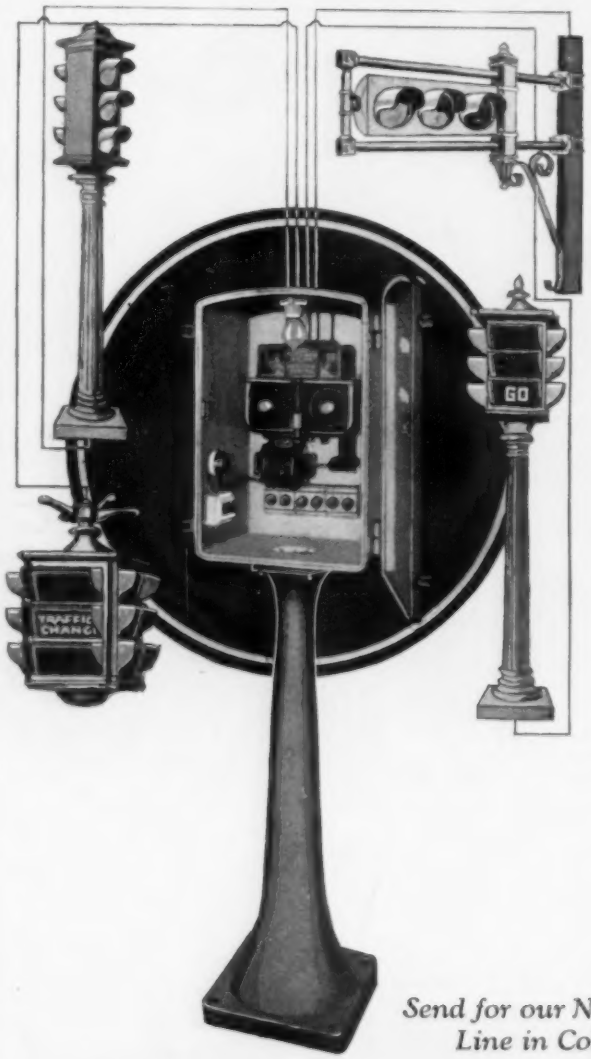
Mesa, Ariz., Installs Its First Complete Fire-Alarm System

A complete fire-alarm installation at Mesa, Ariz., has just been finished by the Gamewell Company, Newton Upper Falls, Mass. The new system, which is the first complete system Mesa has installed, has been put through every test and is now ready for permanent operation. There are 25 fire-alarm boxes connected with the central office. The central office apparatus consists of a two-circuit storage-battery board, one register, one take-up reel, two 10-inch turtle gongs, two 6-inch turtle gongs, one test clock, one transmitter, one 60-inch 4-shelf battery rack, 80 cells of F.I.P. battery, one motor-generator set, and one light switch.

A type-B Diaphone unit is used as a public alarm. This unit, operated by means of compressed air, sounds the code signals.

CLEARING SAND FROM THE SIDEWALKS OF REDONDO BEACH, CALIF.

ESSCO
Traffic Control
SYSTEMS

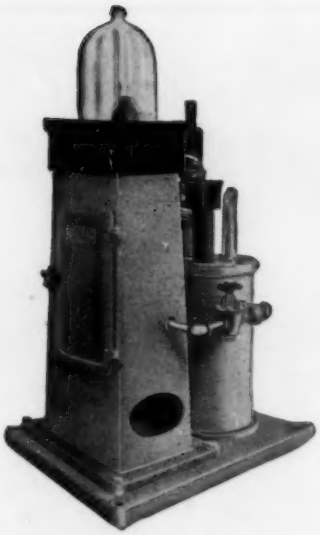


ESSCO
TRAFFIC
Control Systems
Are Standard

Essco Signals are scientifically constructed of the finest materials; can be obtained in many types of design and control and are recognized as the best traffic signals on the market.

Send for our New Catalog Showing Our Entire Line in Colors with Full Information

ESSCO MANUFACTURING CO.
PEORIA, ILLINOIS



THE NEW W & T VACUUM FEED CHLORINATOR

An Automatic Vacuum Solution Feed Chlorinator

The new W & T automatic vacuum solution feed chlorinator Type-ASV made by Wallace & Tiernan Company, Inc., Newark, N. J., and to be exhibited at the American Water Works Association Convention at Buffalo, June 7-11, uses differential heads obtained by the flow of water through a Venturi tube, orifice plate, Pitot rod, or the head from a flow over a weir. This differential is transmitted to a reducing device which varies the vacuum head on the chlorine meter in the vacuum chamber of the chlorinator precisely in proportion to the flow of water to which the chlorine is being applied. An accuracy test of one of these units after several weeks' operation indicated, according to the manufacturers, that the average variation of the chlorine flow from the theoretically correct chlorine flow was only 0.38 of 1 per cent, the maximum error being 3 per cent and the minimum error zero.

City Tests One-Man Grader

The City Commissioners of Kenedy, Texas, recently purchased a Wehr one-man grader, made by the Wehr Company, Milwaukee, Wis. Hon. John W. Thames, Mayor, maintained a record of the operation of this machine in the grading of the streets. According to his figures, the cost for fuel, including lubricating oil, for the grading of 88 blocks totaled only $7.50, or about 8½ cents per block of 360 feet, or $1.26 per mile.

The tractor-grader is operated by the Superintendent of Water-Works and his assistant, who take turns at this work, when their other duties permit. Careful attention has been given to the operation of the grader, which has been most pleasing to the Mayor and Commissioners, according to a report in the Kenedy *Advance* of April 1, 1926.

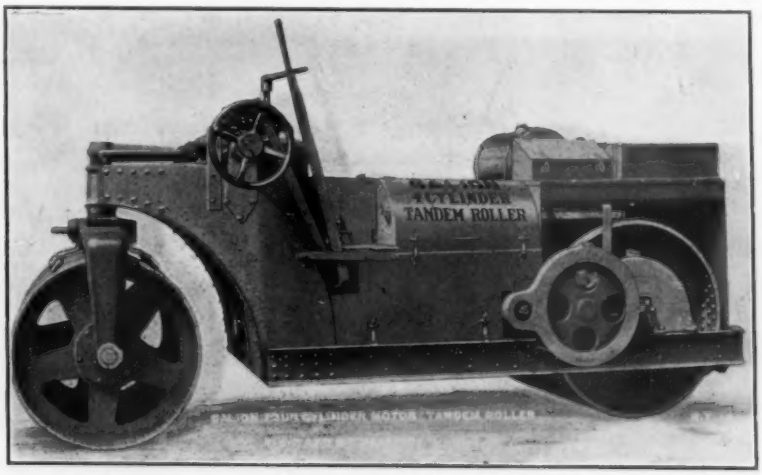
A New Four-Cylinder Tandem Roller

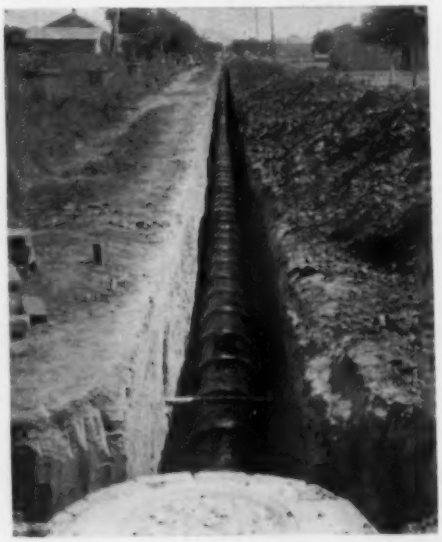
The new 4-cylinder tandem roller announced by the Galion Iron Works & Manufacturing Company, Galion, Ohio, was designed especially for the work it is to do, and while many of the principles and details which have been proved satisfactory in earlier Galion tandem rollers have been retained, the new roller is really new and not simply an adaptation. Simplicity of operation, ample power, freedom from vibration, and long service with a minimum of attention or trouble, were objects sought.

The roller is equipped with a Hercules 4-cylinder motor of ample power mounted on a sturdy rigid chassis frame, reducing vibration. The gearing to the driving roll is a simple spur-gear arrangement. The roller has two speeds each way of 2 and 3½ miles per hour. The special Galion transmission is equipped with Timken bearings throughout. Gears, shafting, and bearings are enclosed in a cast iron case, and the entire mechanism is enclosed in a sheet metal housing which has doors making the interior accessible for any necessary adjustments.

Both hand and power steering gear are provided, the latter being directly driven from the crankshaft of the motor to a countershaft from which the front roll can be turned positively and easily whether the machine is in motion or standing still.

THE NEW GALION 4-CYLINDER ROLLER





THERE are few materials that can withstand the disintegrating forces of nature but Vitrified Salt Glazed Clay Pipe is one of them. It is *permanent*.

Clay Products Association
Chamber of Commerce Bldg.
Chicago.

VITRIFIED Salt Glazed CLAY
Sanitary Sewer Pipe
AC6-Gray

Keep Your City Sanitary--

with a

GODER
Municipal Waste Destructor

The most important problem of any city or town administration is to keep the health of its citizens at the highest possible level.

Good health means a happy, contented, progressive populace.

A reputation for healthful ness is one of the strongest forces to attract new citizens of the right caliber.

A GODER Municipal Waste Destructor increases municipal health by disposing of disease-laden waste and garbage—quickly, completely and without offending odors.

Another advantage found in a GODER is its low cost of operation.

Full information and preliminary consultation to interested executives—without obligation.

GODER INCINERATOR CORP.
313 N. Michigan Blvd.
CHICAGO, U. S. A.

Hand This Memo to Your Secretary Now

Write to the GODER INCINERATOR CORP., 313 N. Michigan Ave., Chicago, and ask them to send me literature and information on Waste Disposal Plants for municipal use. No obligation in this request.

A Red Flash
— *for* Warning

THE Red Head Beacon flashes a warning of danger. The ruby Holophane refractor sends a penetrating beam of light to warn the approaching motorist. A Mercury Contact Flasher in the base of the standard makes and breaks the circuit, thus producing the red flash.

A Steady White Light
—*for* Safety

A white light from beneath the canopy illuminates the white standard and the immediate area surrounding it. The distance to a red light flashing in the dark is hard to estimate. The patch of illuminated roadway enables the motorist to see the exact position of the beacon and pass around it in safety.

Ask for
Leaflet L-20273

Westinghouse Electric & Manufacturing Company
George Cutter Works South Bend, Indiana
Sales Offices in All Principal Cities of
the United States and Foreign Countries

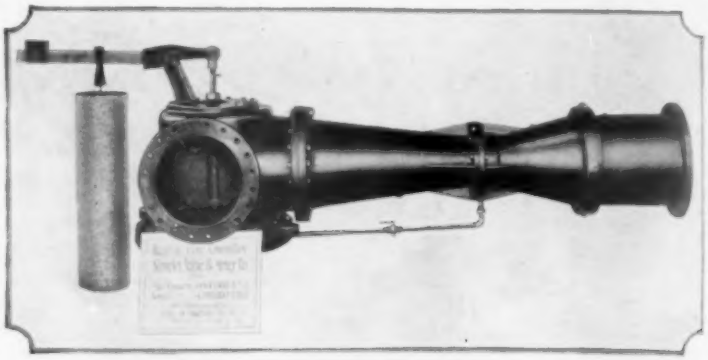
Westinghouse

X87893

View showing **SIMPLEX** Filter Gage with indicating loss of head and rate dials, recording loss chart and flow totalizer.

For Buffalo's new Filter Plant

The Buffalo Filtration Plant was designed under the direction of Geo. C. Andrews, Engineer, Filtration Division and in accordance with specifications of Fuller & McClintock, Consulting Engineers. The Pitt Construction Co. were the contractors for the Filter Equipment.



SIMPLEX Rate of Flow Controller equipped for master control.

SIMPLEX Venturi Tube Meter indicator recorder and totalizer.

SIMPLEX

Meters, Controllers and Gages

This 160,000,000 gallon filtration plant is an achievement in modern water works engineering. Every conceivable provision for maintaining a high operating economy has been included in the design.

SIMPLEX VENTURI TUBE METERS will measure, record and totalize the raw water, clear water and wash water.

SIMPLEX FILTER WASH WATER RATE and two SIMPLEX WASH WATER DEPTH GAGES with 30 in. illuminated dials will keep the operators informed on the washing process. Eight other SIMPLEX ELEVATION GAGES complete with equipment.

Simplex Valve & Meter Company

6743 Upland St. **Philadelphia, Pa.**

Manufacturers of meters, rate controllers of Venturi type, gages, air and vacuum valves, and other water works devices.